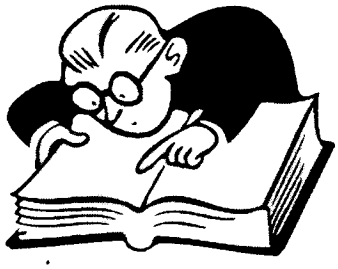

BULKY DOCUMENTS

(exceeds 300 pages)

Proceeding/Serial No: 91168906

Filed: 11-21-2007

Title: Applicant's Trial Memorandum

Part 1 of 2

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November 20, 2007

Via U.S.P.S. Express Mail
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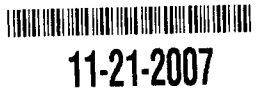
UNITES STATES PATENT AND TRADEMARK OFFICE
Trademark Trial and Appeal Board
P.O. Box 1451
Alexandria, VA 22313-1451

Re: The American Academy of Neurology v. Brain Matters Inc.
Opposition No. 91168906
Mark: Brain Matters
Serial No. 78/321,810
Filing Date: 10/31/2003
Published: 12/20/2005

Dear Sir or Madam:

Enclosed for filing with your office, please find the following documents:

1. Applicant Brain Matters, Inc.'s Trial Memorandum
2. Affidavit of John Goodhue with Exhibits
3. Affidavit of Charles Reed with Exhibits
4. Affidavit of Julie Banta
5. Affidavit of Nancy Goodhue
6. Deposition transcript with Exhibits of Melanie Hoffert dated 1/18/07 (Redacted Version)
7. Deposition transcript with Exhibits of Tami Boehne dated 1/18/07
8. Deposition transcript with Exhibits of Murray Sagsveen dated 1/18/07
9. Stipulation Regarding Authenticity of Certain Documentary Evidence



11-21-2007

U.S. Patent & TMOfc/TM Mail Rcpt Dt #30

10. Stipulation Permitting Affidavit Testimony

11. Notice of Reliance

12. Notice of Reliance II

13. Envelope of Sealed Testimony

14. Certificate of Service

Sincerely,

Thomas P. Howard

Encl.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

The American Academy of Neurology,	)	Opposition No. 91168906
	)	
Opposer	)	Mark: BRAIN MATTERS
	)	
	)	Serial No. 78/321,810
v.	)	
	)	Filing Date: 10/31/2003
Brain Matters, Inc.,	)	
	)	
Applicant	)	Published: 12/20/2005

APPLICANT BRAIN MATTERS, INC.'S TRIAL MEMORANDUM

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STATEMENT OF THE ISSUES

The only issue is whether Applicant's mark "Brain Matters" is likely to cause confusion as to the source of the identified services given The American Academy of Neurology's registered mark The Brain Matters® .

INTRODUCTION

Stated simply, this Opposition should not have been filed. Applicant Brain Matters, Inc. ("BMI") is a medical services company using SPECT brain imaging scans to assist medical professionals in their provision of diagnostic services to patients. *See* Affidavit of John Goodhue, BMI's CEO, ("J. Goodhue Aff."), ¶2. The company provides retail medical services for patients referred from a number of different sources. BMI is a commercial enterprise. *Id.* It charges for providing the scans, reading the scans, and patient consultation, all in one fee. It accepts credit cards and most health insurance plans. *Id.*

SPECT is single photon emission computed tomography brain imaging. It allows physicians to determine the degree to which blood is accessing different areas of the patient's brain. SPECT provides physicians a diagnostic tool for evaluating and better understanding the neurological and psychiatric dysfunctions of their patients. *See* J. Goodhue Aff., ¶3. BMI began offering SPECT imaging to the public in November 2003. *See* J. Goodhue Aff., ¶4.

In October 2003, BMI submitted an application to register the mark "Brain Matters," Serial No. 78321810. After an amendment, BMI's services were, and still are, defined as "Medical services, namely, brain imaging services, brain diagnostic services."

The Opposer in this matter is the American Academy of Neurology (the "Academy"). The Academy, a nonprofit member-based organization, bases this opposition on its Registration No. 2663399, registered as "The Brain Matters." The description of the mark is: "Providing information in the field of neurology via the Internet". The Academy uses its mark "The Brain Matters" on an Internet website located at www.thebrainmatters.org (the "Academy's Website"). The Academy now admits to providing no medical services whatsoever. *See* Deposition of Melanie Hoffert, the Director of Marketing Communications and Digital Division of the Academy, ("Hoffert Dep."), p.34, ll. 15-17:

> Q. The academy itself doesn't provide any medical services, does it?
>
> A. Right. Correct.

Indeed, although Ms. Hoffert initially defined "medical services" to include providing information, she ultimately conceded that the Academy "does not treat patients, our members do." Hoffert Dep., p. 35, ll. 1-4.

Furthermore, the Academy has now admitted to not providing the same services as BMI:

> Q. Now [the Academy] doesn't provide any brain imaging scans, do they?
>
> A. No.
>
> Q. And they don't offer any SPECT imaging scans?
>
> A. No.

Hoffert Dep., p. 69, ll. 9-13. As Ms. Hoffert conceded under oath, the Academy and BMI do not provide the same services and they do not compete. In fact, the Academy's Website does not mention SPECT imaging scans at all. *See* Exhibit 2 to the Affidavit of

Murray Sagsveen ("Sagsveen Aff.), the Academy's General Counsel. Exhibit 2 consists of relevant excerpts from the Academy's Website.

The examining attorney initially denied BMI's Application, citing a likelihood of confusion with the Academy's mark. On September 2, 2005, BMI filed an Ex Parte Appeal with the Trademark Trial and Appeal Board, setting forth a detailed comparison of the marks and the substantively different markets in which they concurrently operate, pursuant to *In re E.I. DuPont DeNemours & Co.*, 476 F.2d 1357 (Customs and Patent Appeals, 1973). The examining attorney, upon review of that filing, allowed the publication of BMI's mark. On November 30, 2005, the application was published. Subsequent to that publication by the Patent and Trademark Office, the Academy filed this Opposition.

BMI respectfully requests that the Trademark Trial and Appeal Board reaffirm the examining attorney's determination that there is no likelihood of confusion between BMI's two word mark "Brain Matters" and the Academy's three word mark "The Brain Matters". Both marks today continue, after four years, to be concurrently used within noncompetitive fields of practice. Absolutely no evidence of actual consumer confusion has arisen during that period. For each of the reasons set forth above, as well as set forth below, the Opposition should be rejected and BMI's registration should be allowed.

STATEMENT OF FACTS

As set forth above, BMI provides medical services in the form of brain imaging. Its Mission Statement is as follows:

> Brain Matters Imaging Centers is dedicated to enhancing the quality of people's lives by providing convenient nationwide access to state of the art brain function imaging clinics. Our high resolution SPECT brain scans assist physicians & clinicians in properly evaluating, diagnosing, and treating their patients. Our comfortable clinics are staffed with caring, compassionate, professionals dedicated to making a visit to one of our clinics enjoyable and rewarding for patients and families alike.

See Exhibit 1 to the J. Goodhue Aff., excerpts from BMI's Website. BMI has physical locations where it provides medical services to patients. *Id.* The Academy's Website, on the other hand, provides only educational services.[1]

BMI operates a website at www.brainmattersinc.com ("BMI's Website"). It introduced the site in November 2003. The purpose of BMI's Website is to obtain patients to have SPECT imaging scans for a fee. *See* Affidavit of Charles Reed, BMI's Chief Business Development Officer, ("Reed Aff."), ¶5. BMI's website discusses various medical and psychiatric illnesses within the context of obtaining patients to use its SPECT imaging services. *Id.*

BMI promotes its SPECT imaging services through advertising in a number of media, including radio, television, print, signage and BMI's Website. *See* Reed Aff., ¶4. The largest percentage of patients and potential patients learn about and contact BMI as a result of television advertisements – 53.71%. *See* Reed Aff., Exhibit 7. BMI's Website produces only 17.4% of its inquiries from patients and potential patients. *Id.*

There is no record of any confusion occurring at any time since the filing of the BMI trademark. BMI and the Academy have concurrently used

[1] The Academy has registered its mark in Class 44; however, its mark is used only in connection with educational services and, therefore, should be registered in Class 41.

their respective marks in completely separate markets for four years. During that time, no one has contacted BMI in confusion about whether it was related to, or sponsored by, the Academy. *See* J. Goodhue Aff., ¶11, 12; Reed Aff., ¶7, 8; Affidavit of Julie Banta, BMI's Director of Patient Care Coordination, ("Banta Aff."), ¶5, 6; Affidavit of Nancy Goodhue, BMI's Chief Clinical Officer and Clinic Director, ("N. Goodhue Aff."), ¶5, 6. Similarly, the Academy has not identified a single instance of confusion.[2]

ARGUMENT

The ultimate question here is whether it is likely that consumers will be confused by any similarity between the Academy's Mark and that of BMI. The issue of the likelihood of consumer confusion has been termed a question of fact. *Coca-Cola Company v. Snow Crest Beverages, Inc.*, 162 F.2d 280 (1st Cir. 1947). There is no litmus test that can provide a ready guide for all cases. Thus, in testing for likelihood of confusion, both the courts and the TTAB consider the following factors:

1) The similarity or dissimilarity of the marks in their entireties as to appearance, sound, connotation and commercial impression;
2) The similarity or dissimilarity and nature of the goods or services as described in an application or registration or in connection with which the prior mark is in use.

[2] A single member of the Academy contacted the Academy's General Counsel, Murray Sagsveen, several years ago to point out the fact that BMI is using this name. The Academy is not arguing that said member was confused. *See* Sagsveen Aff., ¶5 and Exhibit 3 to the Affidavit.

3) The similarity or dissimilarity of established, likely-to-continue trade channels;

4) The conditions under which the buyers to whom sales are made, *i.e.*, "impulse" vs. careful, sophisticated purchasing;

5) The fame of the prior mark (sales, advertising, length of use);

6) The number and nature of similar marks in use on similar goods;

7) The nature and extent of any actual confusion;

8) The length of time during and conditions under which there has been concurrent use without evidence of actual confusion;

9) The variety of goods on which a mark is or is not used (house mark, "family" mark, product mark);

10) The market interface between applicant and the owner of a prior mark:

11) The extent to which applicant has a right to exclude others from use of its mark on its goods;

12) The extent of potential confusion, *i.e.*, whether *de minimus* or substantial; and

13) Any other established fact probative of the effect of use.

In re E.I. DuPont DeNemours & Co., 476 F.2d at 1357, 1361. Not all factors are analyzed in every case.

A. The Nature of the Services are Unrelated

The first of the *DuPont* factors considered herein is the proximity or relatedness of the goods and/or services. *In re E.I. DuPont DeNemours & Co.*, 476 F.2d at 1361, 177 U.S.P.Q. at 567. Where likelihood of confusion is

asserted, the issue must be resolved not solely by comparing the marks, but also by comparing the relevant goods and/or services to determine if they are related. *CBS Inc. v. Morrow*, 708 F.2d 1579, 1581 (Fed. Cir. 1983); *Squirtco v. Tomy Corp.*, 697 P.2d 1038, 1042-43 (Fed. Cir. 1983). The relevant goods and/or services may be related only if they are "marketed and consumed such that buyers are likely to believe that [they] come from the same source, or are somehow connected with or sponsored by a common company." *Homeowners Group, Inc. v. Home Mktg Specialists, Inc.*, 931 F.2d 1100, 1109 (6th Cir. 1991). If the goods or services are totally unrelated, confusion is unlikely. *AMF v. Sleekcraft Boats,* 599 F.2d 341, 348 (9th Cir.1979).

An analysis of the marketplace within which the relevant services are provided in this matter demonstrates that BMI and the Academy provide completely unrelated services, and use their marks for wholly different purposes. BMI provides SPECT imaging services for the purpose of assisting physicians and patients with the diagnosis and treatment of complex brain-related disorders. The Academy is a nonprofit entity that does not sell, market or provide medical services, including but not limited to SPECT imaging services. The Academy's "service" as described in their trademark filing is the provision of information in the field of neurology via the Internet. Here, the Academy maintains an Internet web site that provides general information to the public regarding a limited number of neurological disorders. These marks are completely unrelated and do not apply to any goods or services that compete in any marketplace, for which reason there is no likelihood that consumer confusion will occur.

To support a finding of likelihood of confusion, there must be a "strong possibility" that either of the parties may expand their product lines to compete with the other. *AMF*, 599 F.2d at 341, 348. Here, there is absolutely no evidence that either party is likely to compete with the other, either now or in the foreseeable future. Indeed, in the case at hand the Academy constitutes a nonprofit entity operating a noncommercial web site for the purpose of providing public information. The Academy lacks any "product line" to expand, is not a medical service provider, and is plainly not planning to "compete" in any manner with BMI within the field of SPECT imaging services.

Simply alleging a similarity of marks is not sufficient to establish likelihood of confusion, particularly where noncompetitive goods are involved. 2 J. McCarthy, §24:3 at 170. Both the Federal Circuit and the Board have explicitly declined to find a likelihood of confusion where -- as here -- the services and/or goods on which the parties' marks are used are significantly different. *See Dynamic Research Corp. v. Langenau Mfg. Co.*, 217 U.S.P.Q. 649 (Fed. Cir. 1983) (there is no likelihood of confusion, even though both parties used the identical mark DRC, because the marks are used on goods that are "quite different" and sold to different discriminating purchasers); *Electronic Data Systems Corp. v. EDS A Micro Corp*, U.S.P.Q.2d 1460 (T.T.A.B. 1992) (confusion not likely between EDSA and design for computer programs for electrical distribution systems analysis and EDS for computer data processing programming services, despite conceded fame of EDS).

This factor must be weighed strongly in the favor of BMI.

B. The Trade Channels of the Parties are Entirely Dissimilar and Will Always Remain Dissimilar

The next *DuPont* factor that must be considered is the similarities or dissimilarities of established and likely to continue trade channels. *In re E.I. DuPont DeNemours & Co.*, 476 F.2d at 1361, 177 U.S.P.Q. at 567. BMI is a commercial vendor that provides SPECT scanning services from physical locations. The registration of the Academy contains an express limitation in that it specifically states that its channel of trade is limited to the Internet, *i.e.*, "Providing information in the field of neurology *via the internet.*" (Emphasis added). Therefore, the only issue to be addressed is any likelihood of confusion between the two marks arising from the parties' Internet content dissemination. No such likelihood of confusion exists.

First, any patient, physician or other party who is considering SPECT medical imagery services would be certain to use care in determining that he/she accesses the correct website and obtains the proper information. *See, Versa Prods. Co. v. Bifold Co. (Mfg.),* 50 F.3d 189, 204 (3rd Cir. 1995) ("The more important the use of the product, the more care that must be exercised in its selection"); *Astra Pharm. Prods., Inc. v. Beckman Instruments, Inc.*, 718 F.2d 1201, 1206-07 (1st Cir. 1983) (expensive health care equipment elevated concern of purchasers). This is particularly the case as the Academy's web site contains absolutely no information concerning SPECT imagery services. Under these circumstances, relevant purchasers or parties placed in the position of

decision makers are extremely unlikely to become confused, even if they accidentally access the Academy's Website instead of BMI's Website.[3]

Second, the mere utilization of the Internet by two parties with similar marks does not, as a matter of law, constitute a basis for finding overlap of marketing channels. *See, Entrepreneur Media, Inc. v. Smith*, 279 F.3d 1135, 1151 (9th Cir. 2002). Rather, it must be demonstrated that the parties use the Internet as a *substantial* marketing and advertising channel, use their marks in conjunction with Internet-based products, and have marketing channels that overlap in other ways. *Id.* (Emphasis in original).

Here, no evidence exists demonstrating that the Academy uses the Internet as a substantial marketing and advertising channel for any product, much less that it markets any product whatsoever. Rather, it provides a non-profit Internet site for public information. On its face, the simultaneous usage of the Internet by BMI and the Academy, without more, does not create any basis on which to allege the overlap of marketing channels. *Id.* This is especially true in this matter, wherein there has been no evidence of confusion during the entire four years that BMI has been in operation.

C. The Marks Are Dissimilar in Sound and Commercial Impression

The next of the DuPont factors to be addressed requires an examination of whether the marks, as described in the Academy's registration and BMI's application, are similar in appearance, sound, connotation and commercial

[3] Similarly, BMI's web site contains absolutely no information about the Academy, and provides solely information pertaining to the use and application of SPECT imagery services.

impression. Similarity of the marks in one respect - sight, sound or meaning - will not automatically result in a finding of likelihood of confusion even if the goods are identical or closely related. TMEP 1207.01(b)(i). All relevant factors in a particular case must be analyzed. *In re Lamson Oil Co.*, 6 USPQ 2d 1041, 1043 (TTAB 1987). Here, although the marks may be similar in appearance, in all other respects, the marks are dissimilar.

The meaning or connotation of a mark must be determined in relation to the named goods or services. Even marks that are identical in sound and/or appearance may create sufficiently different commercial impressions when applied to the respective parties' goods or services so that there is no likelihood of confusion. *See, e.g., In re Sears, Roebuck and Co.*, 2 USPQ 1312 (TTAB 1987)(CROSS-OVER for bras held not likely to be confused with CROSSOVER for ladies' sportswear, the board finding that the term was suggestive of the construction of applicant's bras, but was likely to be perceived by purchasers either as an entirely arbitrary designation or as being suggestive of sportswear that "crosses over" the line between informal and more formal wear when applied to ladies' sportswear); *In re British Bulldog, Ltd.*, 224 U.S.P.Q. 854 (TTAB 1984)(PLAYERS for men's underwear held not likely to be confused with Players for shoes, the Board finding that the term PLAYERS implies a fit, style, color and durability adapted to outdoor activities when applied to shoes, but implies something else, primarily indoors in nature, when applied to men's underwear); *In re Sydel Lingerie Co., Inc.*, 197 USPQ 629 (TTAB 1977)(BOTTOMS UP for ladies' and children's underwear held not likely to be

confused with BOTTOMS UP for men's clothing, the Board finding that the term connotes the drinking phrase "Drink Up" when applied to men's suits, coats and trousers, but does not have this same connotation when applied to ladies' and children's underwear).

The Academy argues that removing the first word "The" from its mark does nothing to change the similarity of the marks, relying on *In re Dixie Rests.*, 105 F.3d 1405 (Fed. Cir. 1997). In *Dixie Rests.*, the court disregarded the word "the" in the rejected mark, "The Delta Café," holding the dominant portion of the marks -- the trade name "Delta Cafe" -- to be so similar as to warrant denial of registration. In the matter at hand, the situation is markedly different. Here, the Academy in 2002 registered a descriptive three-word trademark for a noncommercial educational web site entitled "The Brain Matters". The mark, by including the word "The", creates a sentence that places the emphasis on the two words "The Brain" followed by "Matters", thereby explicitly stating to the reader that "the brain is important." This specific intent was confirmed by the Academy's witness, Melanie Hoffert during her deposition. *See* Deposition of Melanie Hoffert ("Hoffert Dep."), p.25, ll. 9-19.

In 2003, BMI filed the two-word suggestive mark "Brain Matters." By stating "Brain Matters", the sound and commercial connotation of this mark suggests matters concerning the brain. This specific intent was described in the testimony of Nancy Goodhue, the originator of the mark. *See* N. Goodhue Aff., ¶3. This Affidavit

Testimony is consistent with Ms. Goodhue's deposition testimony ("N. Goodhue Dep.").[4] *See* N. Goodhue Dep., p. 11, l. 21 – p. 12, l. 22:

> Q. Why did you think it was a great name for the clinic?
>
> A. I just wanted something that was all encompassing abut matters to do with the brain.
>
> Q. Why did you think this was all encompassing?
>
> A. Because we were a brain imaging company and it just seemed to say what it is that we did.
>
> ...
>
> Q. Okay. How about using the term "matters" as – like its important, brain matters, the brain is important. Was that part of your thought process?
>
> A. I think it was, yes because it does.
>
> Q. Had you done...
>
> D. It was more, you know, all the matters to do with the brain.

Because the sound, connotation and commercial impression of the two marks are completely different, and because the marks are in fact used in completely different markets, concurrent use of the marks is unlikely to cause consumer confusion. In fact, absolutely no such confusion has occurred.

D. The Prior Mark is a Weak Designation Entitled to the Lowest Level of Protection; Similar Marks Are Frequently Used On Other Goods

Confusion is still further unlikely to occur because the common portions of the marks are descriptive or suggestive. TMEP 1207.01(b)(viii). Thus, consumers typically will be able to avoid confusion unless the overall

[4] This deposition testimony is admissible because it is necessary to make the Academy's citation to Ms. Goodhue's deposition complete.

combinations of words have other commonality. *Id*; s*ee, e.g.*, *In re Bed & Breakfast Registry,* 791 F.2d 157 (Fed. Cir. 1986)(BED & BREAKFAST REGISTRY for making lodging reservations for others in private homes not likely to be confused with BED & BREAKFAST INTERNATIONAL for room booking agency services); *The U.S. Shoe Corp v. Chapman*, 229 USPQ 74 (TTAB 1987)(COBBLER'S OUTLET for shoes held not likely to be confused with CALIFORNIA COBLERS (stylized) for shoes); *In re Istituto Sieroterapico E Vaccinogeno, Toscano "SCALOVO" S.p.A.*, 226 USPQ 1305 (TTAB 1985)(ASO QUANTUM (with ASO disclaimed) for diagnostic laboratory reagents held not likely to be confused with QUANTUM 1 for laboratory instruments for analyzing body fluids). As with these cases, the descriptive or suggestive terms "the brain" and "matters" in the Academy's Mark, and "brain" and "matters" in BMI's Mark, are unlikely to – and in fact have not -- lead to consumer confusion as a result of the markedly different purposes for which they are used.

In addition, the "The Brain Matters" mark is a descriptive or, at the most, suggestive designation entitled to the lowest level of protection. *See Colgate-Palmolive, Co. v. Carter-Wallace, Inc.*, 432 F.2d 1400, 1401-2, 167 U.S.P.Q. 529 (C.C.P.A. 1970) (a portion of the mark is "weak" to the extent it is suggestive, or is in common use by many other sellers in the market); *First Savings Bank FSB v. First Bank System, Inc.* 101 F.3d 645, 653-54 (10th Cir. 1996). Terms such as "brain" and "matters" are in common use by many providers of services in this medical marketplace. Just three examples include

BRAINMAP, Serial No. 77068589, BRAIN TRUST, Serial No. 76576707, and BRAINSAVERS, Serial No. 78672668, each of which constitutes a service provider in the field of the human brain. In fact, as of May 22, 2007, there were a total of 570 live records found in TESS using "Brain" as a portion of its name; another 690 live records found in TESS using "Matters" as a portion of its name. Copies of the TESS records attesting to these facts are attached as Exhibit A and B of BMI's "Notice of Reliance II" in which BMI asked the TTAB to take judicial notice of these facts. Similarly, the parties' "Stipulation Regarding Authenticity of Certain Documentary Evidence" recognizes the authenticity of printouts from seven separate websites, not associated with the parties in this matter, that also use the term "brain matters" as part of their URL. *See*:

http://rightbrainmatters.com;

http://mybrainmatters.com;

http://www.brainmatters.com.my/home.htm;

http://brainmatters.com.my/companyprofile/companyprofile.htm;

http://www.clubtnt.org/brain_matters_web;

http://www.clubtnt.org/brain_matters_web/Index.htm; and

http://www.clubtnt.org/brain_matters_resources.htm pp. 1 and 2 of 44.

An additional two use "new brain" in the same capacity. *See*:

http://www.zoot.com/newbrain; and

http://www.zoot.com/newbrain/BrainWelcome/Welcome.html.

These facts are the equivalent of a dictionary definition showing multiple uses of these words. It also is probative in demonstrating the lack of distinctiveness and strength of the Academy's Mark. *See, General Mills, Inc. v. Kellogg, Co.*, 824 F.2d 622, 626 (8th Cir. 1987)("Evidence of third party usage of similar marks on similar goods is admissible and relevant to show that the mark is relatively weak and entitled to a narrow scope of protection").

As the United States Supreme Court specifically held, registration of a trademark does not award the trademark owner a monopoly on the use of a phrase. *United Drug Co. v. Theodore Rectanus Co.*, 248 U.S. 90, 97 (1918) ("trademark rights are not "right[s] in gross"). Rather an "important limitation central to the law of trademarks" is that "trademark protection [is limited] to the protection of marks as used on particular goods." *Decosta v. Viacom Int'l Inc.*, 981 F.2d 602, 609 (1st Cir. 1992).

In the case at hand, the Academy's Mark should be narrowly limited in scope to precisely what it states: "*Providing information* in the field of neurology via the internet." It should not be extended to include "providing medical services" or "providing brain scans."

D. There Has Been No Actual Confusion in Four Years of Concurrent Use

"Actual confusion" means actual consumer confusion that allows the seller to pass off his goods as the goods of another. *See, The Sports Authority, Inc. v. Prime Hospitality Corp.*, 89 F.3d 955, 963 (2d Cir. 1996). Actual confusion is the best evidence of likelihood of confusion. *Id.* "Absent evidence

of actual confusion, when the marks have been in the same market, side by side, for a substantial period of time, there is a strong presumption that there is little likelihood of confusion." *Pignons S.A. de Mecanique de Precision v. Polaroid Corporation*, 657 F.2d 482, 490 (1st Cir. 1981). "Four years is a substantial period of time." *Id.*

Since there has not been any confusion in the four years that the parties used their marks concurrently, there is no reason to believe that there would be such confusion in the future. *Id*; *See also, Versa Prods. Co.,* 50 F.3d at 189 ("If a defendant's product has been sold for an appreciable period of time without evidence of actual confusion, one can infer that continued marketing will not lead to consumer confusion in the future"), *cert. den.*, 516 U.S. 808 (1995); *Keebler Co. v. Rovira Biscuit Corp.*, 624 F.2d 366, 377 (1st Cir. 1980)(three and one half years without a showing of actual confusion is sufficient to find no likelihood of confusion); *See also, Oreck Corp. v. U.S. Floor Systems, Inc.*, 803 F.2d 166, 173 (5th Cir. 1986)(concurrent use for seventeen months with no actual confusion is "highly significant"), *cert. den.* 41 U.S. 1069 (1987).

The Academy, rather than address the fact that there has been no actual confusion, urges the TTAB to disregard the testimony of BMI's witnesses, all of whom testified that they were unaware of any actual confusion during the four year period of concurrent use. In support of that position, the Academy cites *In re Majestic Distilling*, 315 F.3d 1311 (Fed.Cir.2003). However, its citation to that case, in which the court dismissed an applicant's testimony,

stating that "uncorroborated statements of no known instances of actual confusion are of little evidentiary value," is out of context. The Academy does not point out that *Majestic* arose in the context of an *ex parte* proceeding, and that court explicitly made note of the fact that there was no adverse party. *Id.* That is unlike the situation here where there is an opposer to cross-examine the witnesses or offer its own testimony of actual confusion, if there was any to offer. Its citation to *In re Bissett-Berman Corp.*, 476 F.2d 640, 642 (CCPA 1973), suffers the exact same flaw.

The Academy has provided absolutely no evidence of actual confusion, despite four years of concurrent use in the marketplace and full discovery in this proceeding. Where, as here, there has been significant commercial activity by BMI, with recent yearly expenditures of over $670,000 per year on marketing, it may be assumed with reasonable certainty that if confusion has not occurred in the past, the chances for confusion to result in the future are slim. *Haveg Industries, Incorporated v. Shell Oil Company*, 199 USPQ 618, 626 (TTAB 1978).

The words that the Trademark Trial and Appeals Board recently stated upon dismissing the opposition filed in *BFS Diversified Products, LLC v. L & P Property Management Company*, W.L. 1676783, *9 (TTAB, May 23, 2007) are markedly pertinent in the case at hand: "[t]he question that cries out is why there have not been any reported instances of confusion or misdirected inquiries coming to the attention of the parties." The answer to that question is plain. Because the parties provide unrelated services in completely different markets, no confusion exists.

Accordingly, the lack of actual confusion in this matter is a factor that weighs strongly against finding likelihood of confusion.

E. The Academy's Mark is not Famous

The fame of a registered mark is a factor to be considered in determining likelihood of confusion. "A mark with extensive public recognition and renown deserves and receives more legal protection than an obscure or weak mark." *Kenner Parker Toys v. Rose Art Industries,* 963 F.2d 350, 353 (Fed. Cir. 1992). The Academy's reliance on its alleged "fame" is misplaced.

In considering this element of the test, the TTAB's analysis in *The Sports Authority Michigan, Inc. v. The PC Authority, Inc.,* 2002 WL 575 575718 (TTAB 2002) is instructive. That opposition involved the mark THE SPORTS AUTHORITY. In addressing the issue of fame of the mark, the TTAB recognized the following: i) opposer's investment in advertising grew from $1.2 million in 1988 to $70 million in 1998; ii) opposer has 200 stores in 32 states and is the largest sporting goods retailer in the country; and 3) opposer's sales of sports related goods, services and apparel escalated from $3 million in 1987 to nearly $1.6 billion in 1998. *See The Sports Authority Michigan, Inc.* at *13. Even in light of that impressive record, the TTAB refused to categorize the mark as famous, comparing it unfavorably to such marks as PLAY-DOH and FRITO-LAY. *See, The Sports Authority Michigan, Inc. at* *14.

The evidence here is substantially weaker. The Academy points to its use of the mark in commerce, but provides no survey evidence or evidence of

"household penetration or brand awareness that would tend to establish that opposer provides products and services of lasting value." These are factors the TTAB alluded to as significant in its opinion in *The Sports Authority Michigan, Inc.* at *13, factors that are conspicuously absent here.

In addition, the Academy points to its total advertising expenditures over the seven years between October 1999 and August 2006 in the amount of $844,495.30.[5] That is a far cry from the amount spent by The Sports Authority, $70 million. In fact, on a yearly basis, the Academy's expenditure averages out to only 18% of the $670,000 spent promoting BMI's Mark during 2006 alone. *See*, Reed Aff., ¶9. Using the Academy's interpretation of the significance of advertising dollars, BMI's Mark is more famous than the Academy's Mark!

F. BMI Had No Intent to Trade on the Goodwill of the Academy's Mark.

The Academy takes the position that "BMI *likely* knew of the Academy's registration." The Academy's Trial Memorandum at 29. (Emphasis added). This argument is frivolous and set forth as a distraction. There is no evidence that Mr. Goodhue saw the Academy's Mark in the report or, even if he saw it, that he assigned any particular significance to the Academy's Mark. In fact, in his testimony, Mr. Goodhue stated that his first knowledge of the Academy's website or its mark was when he received a letter from the Academy in May

[5] BMI objects to the Academy's reliance on these figures, referred to in the Hoffert Aff., Exhibit 14. During the deposition of Ms. Hoffert, she acknowledged that she could not identify how much of that amount was spent promoting the Academy's Mark on its website and how much was spent for other public education purposes. Hoffert Dep., p. 67, l. 20 to p. 69, l. 4.

2005. *See,* J. Goodhue Aff., ¶13. He further stated that although the Academy's Mark "may have been included in the Search Report provided by counsel before the company filed its registration for the mark "Brain Matters," I took no notice of the name." *Id.*

Even if Mr. Goodhue did see the Academy's Mark, which BMI denies, it is ludicrous to suggest that Mr. Goodhue, who is not trained in the field of intellectual property, would have recognized a relationship between that mark and BMI's Mark, or would have thought that the Academy's Mark had any alleged goodwill on which BMI could profitably trade.

The testimony of Nancy Goodhue, creator of the mark "Brain Matters," is of similar import. In it she expressly states that at the time she created BMI's Mark she was unaware of the Academy's Mark or its website. N. Goodhue Aff., ¶2. Nor did she have any intent to trade on the goodwill associated with the Academy's Mark, if any. *Id.*

CONCLUSION

Confusion cannot be founded upon "mere theoretical possibilities of confusion, deception or mistake or with the de minimis situations but with the practicalities of the commercial world, with which the trademark laws deal." *In re Massey-Ferguson Inc.,* 222 U.S.P.Q. 367, 368 (TTAB 1983). The confusion must "be probable, not simply a possibility." *Murray v. Cable Nat. Broadcasting Co.* 86 F.3d 858, 861 (9th Cir. 1996).

The burden of proof to show likelihood of confusion is on the Academy as the Opposer. *Yamaha Intern. Corp. v. Hoshimo Gakki Co., Ltd.*, 870 F.2d

1572, 1575 (Fed. Cir. 1988); *Sanyo Watch co., Inc. v. Sanyo Elec. Co., Ltd.*, 691 F.2d 1019, 1022 (Fed. Cir.1982). The Academy, rather than offering evidence, has offered only speculation, conjecture and hyperbole in an effort to meet that burden. In the case at hand, it has utterly failed to sustain its Opposition. The Opposition should be denied and BMI's registration should be allowed.

Dated this 19th day of November, 2007

GARLIN DRISCOLL HOWARD, LLC

Thomas P. Howard
Carole K. Jeffery
245 Century Circle, Suite 101
Louisville, CO 80027
Telephone: (303)926-4222
Facsimile: (303)926-4224

ATTORNEY FOR APPLICANT
BRAIN MATTERS, INC.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

The American Academy of Neurology,	)	Opposition No. 91168906
	)	
Opposer	)	Mark: BRAIN MATTERS
	)	
	)	Serial No. 78/321,810
v.	)	
	)	Filing Date: 10/31/2003
Brain Matters, Inc.,	)	
	)	
Applicant	)	Published: 12/20/2005

CERTIFICATE OF SERVICE

I hereby certify that on the 20th day of November, 2007, I caused to be served the attached documents:

1. Applicant Brain Matters, Inc.'s Trial Memorandum
2. Affidavit of John Goodhue with Exhibits
3. Affidavit of Charles Reed with Exhibits
4. Affidavit of Julie Banta
5. Affidavit of Nancy Goodhue
6. Deposition transcript with Exhibits of Melanie Hoffert dated 1/18/07 (Redacted Version)
7. Deposition transcript with Exhibits of Tami Boehne dated 1/18/07
8. Deposition transcript with Exhibits of Murray Sagsveen dated 1/18/07
9. Stipulation Regarding Authenticity of Certain Documentary Evidence
10. Stipulation Permitting Affidavit Testimony
11. Notice of Reliance
12. Notice of Reliance II

13. Envelope of Sealed Testimony

by placing true and correct copies, with all fees prepaid, in the hands of a U.S.P.S. Courier, at Louisville, Colorado addressed to the following:

David A. Prange, Esq.
Plaza VII, Suite 3300
45 South Seventh Street
Minneapolis, MN 55402-1609

COUNSEL FOR OPPOSER

I also certify that on the 20th day of November, 2007, one (1) copy of the foregoing documents, and the original Applicant Brain Matters, Inc.'s Trial Memorandum, were filed with:

UNITED STATES PATENT AND TRADEMARK OFFICE
Trademark Trial and Appeal Board
P.O. Box 1451
Alexandria, VA 22313-1451

by placing true and correct copies, with all fees prepaid, in the hands of a U.S.P.S. Courier, at Louisville, Colorado.

Executed on the 20th day of November, 2007.

Thomas P. Howard

FIN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

The American Academy of Neurology,	)	Opposition No. 91168906
	)	
Opposer	)	Mark: BRAIN MATTERS
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Brain Matters, Inc.,	)	
	)	
Applicant	)	Published: 12/20/2005

AFFIDAVIT OF JOHN GOODHUE

John Goodhue, being duly sworn on oath, states as follows:

1. I am currently President and Chief Executive Officer of Brain Matters, Inc. I am submitting this Affidavit in lieu of appearing for a testimonial deposition. I have first hand knowledge of the matters set forth in this Affidavit and, if called to testify, I would testify in response to appropriate questions as follows.

2. Brain Matters, Inc. is a medical services company using SPECT brain imaging scans to assist medical professionals to provide diagnostic services to patients. The company provides retail medical services for patients referred from a number of different sources. Brain Matters, Inc. is a commercial enterprise. It charges for the scans, reading the scans and patient consultation, all in one fee. It accepts credit cards and most health insurance plans.

3. SPECT imaging is single photon emission computed tomography brain imaging ("SPECT"). It allows physicians to determine the degree to which blood is accessing different areas of the patient's brain. SPECT provides physicians a diagnostic tool for evaluating and better understanding the neurological and psychiatric dysfunctions of patients.

4. Brain Matters, Inc. began offering SPECT imaging to the public in November 2003.

5. I am the person in charge of trademark matters at Brain Matters, Inc. I coordinated with counsel to file the Trademark application. At the time that the registration was filed, I did not believe that there was any reason not to use the mark "Brain Matters" or the name "Brain Matters, Inc." I had no intent to compete with the registration or use of the mark "The Brain Matters" and I had no intent to trade on the goodwill associated with that mark, if any.

6. I developed the sales and marketing plan of Brain Matters, Inc., was personally responsible for implementing the sales and marketing plan in the beginning stages of the company, and the people responsible for sales and marketing now report directly to me.

7. Brain Matters, Inc. has a multi-pronged sales and marketing model aimed at medical professionals and consumers. Consumers include patients, prospective patients, their families and the general public.

8. The name Brain Matters Imaging Centers is used in print, TV and radio ads, and on the internet, signage, business cards, stationary, and business plans. The purpose of all advertising media is to obtain patients to have SPECT imaging scans for a fee.

9. In November 2003, Brain Matters, Inc. introduced an internet website using the website domain name www.brainmattersinc.com. The content of the website has changed over time and an excerpt of the website's content in its present form is attached as Exhibit 1. The purpose of the website is to obtain patients to have SPECT imaging scans for a fee. To the extent that the website contains information about various medical and psychiatric illnesses that may be diagnosed by the imaging, it does so in order to obtain patients to have SPECT imaging scans for a fee.

10. At the top of each page of the internet website, the name "Brain Matters" is accompanied by the term "Imaging Center" and the company's logo. "Brain Matters" is not used in isolation on the website, thus eliminating the risk of any possible confusion with the mark "The Brain Matters."

11. I am not aware of any member of the public confusing the advertising, services, website, or name of Brain Matters, Inc. with that of the AAN, including the AAN's website, www.thebrainmatters.org, at any time since we began using the name.

12. To my knowledge, no person has ever called or otherwise communicated with Brain Matters, Inc. asking whether there is or was a relationship between the AAN and Brain Matters, Inc. I am not aware of any member of the public confusing the mark "The Brain Matters" with the mark "Brain Matters."

13. My first knowledge of the AAN's website or its mark was when I received a letter from the AAN in May 2005. Although the mark "The Brain Matters" may have been included in the Search Report provided by counsel before the company filed its registration for the mark "Brain Matters," I took no notice of the name.

May 16, 2007.

John Goodhue

Subscribed and sworn before me this 16th day of May, 2007 by John Goodhue.
Witness my hand and official seal.

Karla M. Schoen
Notary Public

ILA M. SCHOEN
OTARY PUBLIC
TE OF COLORADO
MMISSION EXPIRES 2/26/2009

EXHIBIT 1

BRAIN MATTERS

:: Testimonials

Home :: Conditions :: Company :: SPECT :: Patient Info :: Contact

"This is the beginning of an exciting new age for practitioners. The information these brain scans provide is very impressive. I am grateful to Brain Matters for the phenomenal contribution they are making to behavioral medicine."

:: Information

FAQ's

HIPAA Compliance

New Patient Forms

Radiation Explanation

Get a Scan

Preparation

Scan Procedure

Payment Options

Center Locations

Brain SPECT Imaging - FAQ's

1. **Why should I have a brain SPECT scan?**

A Brain SPECT scan is an additional tool that supplies objective diagnostic information to your treating physician that can help provide you with better healthcare. It is generally known by physicians the world over which parts of th brain control certain functions and behaviors. There is no question that Brain SPECT Imaging can identify areas of normal high and low blood flow in each a these areas of the brain. So, doesn't it follow that if your physician could use th type of objective information to help him or her form a more informed opinion c or her diagnosis of your condition? Think of it this way. If you had a broken leg your doctor wanted to treat you without getting an x-ray, how would you feel al the treatment you are receiving? Why should your brain be any different?

2. **How would a brain SPECT scan help me if I already have a diagnosis?**

If you have a proper diagnosis and feel like you are being properly treated, oth than being a further objective confirmation of your diagnosis, a brain SPECT s is probably not necessary. However, if you have a diagnosis but you still feel "(sorts" or "not quite right", then you may not have yet obtained a full diagnosis (of the conditions that may be hampering your full access to your brain. This is where we believe brain SPECT imaging can be an enormous help to your trea clinician by being able to identify what other conditions may be present in your brain. With this information, you and your clinician can more quickly and easily design a treatment plan that works for you.

3. **Do I need a referral from my physician for a brain SPECT scan?**

No. Individuals can be referred by their physician or other treating clinician (su a psychologist, counselor or clinical social worker). Individuals can also "self-re and arrangements will be made to assure appropriate follow-up care based on SPECT findings. Of course, if services are determined to be covered by insura a referral may be required by your insurance carrier.

4. **How long does the procedure take?**

Allowing for registration and intake procedures, the total time at the neuro ima center should be around 2 hours. The brain SPECT imaging procedure itself ta around 10 minutes.

5. **Will the test cause me any pain or discomfort?**

Generally there should be no pain or discomfort associated with SPECT scanr The camera itself is open so there is no sense of "being put in a tunnel" like in some MRIs. There is an injection of the imaging agent at the start of the proce that involves a small needle (like being given a shot of medicine). The physicia can order a mild sedative to calm individuals who may be agitated or particular

isn't used more widely is that most referral physicians have minimal training in neuroimaging modalities. Another reason is the paucity of individuals who are trained in this application.

12. **Will My insurance company pay for the scan?**

Although insurance plans vary considerably, most plans will usually pay for ou services.

Functional Brain SPECT Imaging

Neurological Indications

- Brain Trauma
- Anoxic/Toxic Brain Injury
- Seizure
- Stroke Management
- Alzheimer's/Dementia

Neurobehavioral Applications

- ADHD
- Bipolar Disorder
- Depression
- Anxiety Disorder
- Obsessive Compulsive Disorder
- Oppositional Defiant Disorder
- Autism Spectrum Disorders
- Learning Disabilities

BrainMatters

brain function imaging

Clinic Hours

Mon.–Fri. 9:00 a.m.–5:00 p.m.
Evenings and Weekends – By appointment only

Contact us for a FREE consultation
and information packet

Toll-free 1-877-570-2650
Main office 720-941-6428
Fax 720-941-6494

Located in Cherry Creek at:
201 University Blvd., Suite 200
Denver, CO 80206

Visit us online at
www.brainmattersinc.com

What if you could see your brain in action?

BrainMatters

brain function imaging

720-941-6428
www.brainmattersinc.com

WHAT PEOPLE ARE SAYING ABOUT BRAIN FUNCTION IMAGING.

"This is the beginning of an exciting new age for practitioners. I am grateful to Brain Matters for the phenomenal contribution they are making to the changing landscape of behavioral medicine."

LESLIE WINTER, M.D., PSYCHIATRIST

"I am seeing life-changing events happening with my patients who were at the end of their ropes. This is not only offering them hope ... it is saving lives."

GARY NICHOLS, PSYCHOTHERAPIST

"I was extremely skeptical about getting a brain scan. I am SO, SO, SO glad that I went ahead and did it. This technology takes the guesswork out of the whole equation and I finally have the answers that I have sought for over 30 years. I speak for many when I say that this will indeed change my life for the better."

A.B., PATIENT

CALL 720-941-6428 FOR MORE INFORMATION TODAY!

BRAIN MATTERS

brain function imaging

HOW CAN WE SEE BRAIN ACTIVITY?

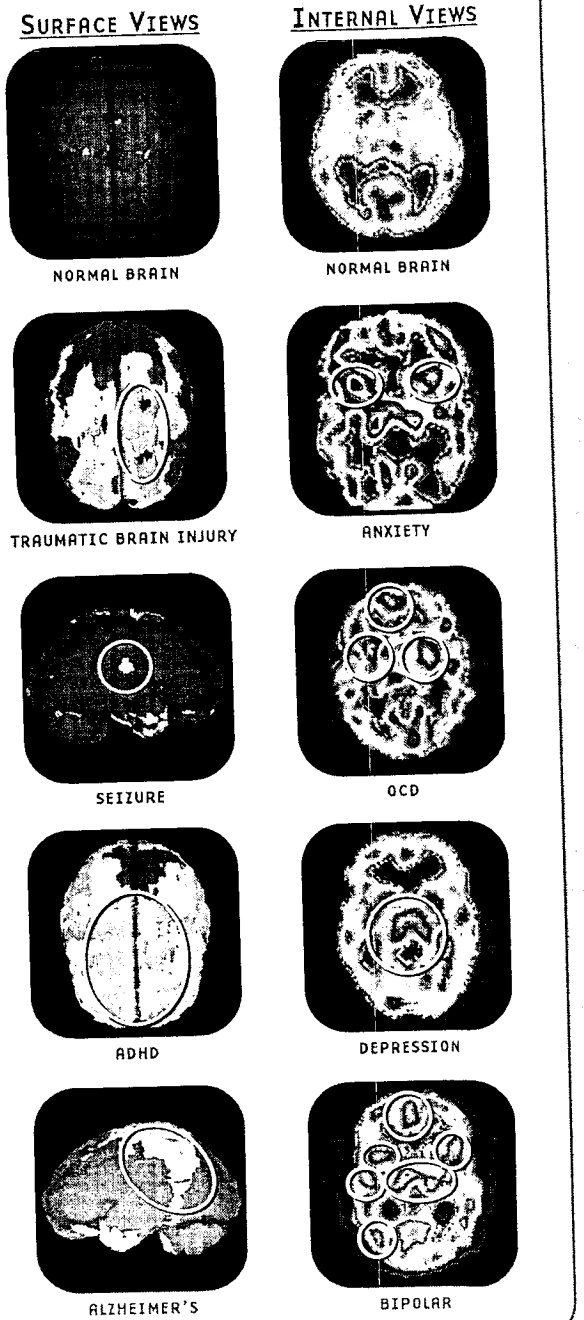
Brain Matters utilizes the next generation in high resolution brain SPECT (Single Photon Emitted Computed Tomography) imaging. It is a widely accepted nuclear medicine study that evaluates brain activity by tracing blood flow in the brain. The blood is the delivery system for the only food the brain uses (glucose). And since the brain cannot store glucose, tracking blood flow allows us to observe the brain's actual metabolic process. Accordingly, by looking at which areas of the brain have too much or too little blood flow, we can determine which areas of the brain are working too hard or not hard enough. Contrast this to other types of imaging studies such as MRI and CT that can only show structural brain abnormalities such as tumors and lesions, and you can easily see why brain SPECT imaging is such an exciting development in the study of how the brain actually works.

- IDENTIFIES UNDIAGNOSED/ MISDIAGNOSED CONDITIONS
- SIMPLIFIES COMPLICATED CASES
- REDUCES STIGMA OF MENTAL ILLNESS
- HELPS FAMILY/FRIENDS UNDERSTAND

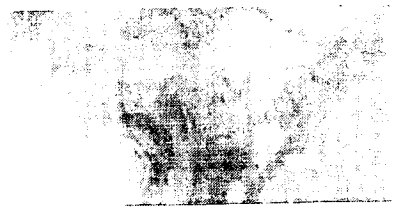
HOW CAN THIS HELP ME?

It is generally known which behaviors each part of the brain controls. Correlating this data with information about which parts of the brain are not working properly provides your doctor with a powerful tool that can help him or her develop better targeted treatment plans for you. This can be especially helpful for complicated and previously misdiagnosed cases.

Best of all, a brain SPECT scan finally allows you to actually see that there is a physiological source of your behavioral problems, thus helping you feel less stigmatized by the "mental illness" label. This can often help your family and friends better understand and support you.



BRAIN MATTERS



:: Testimonials

Home :: Conditions :: Company :: SPECT :: Patient Info :: Contact

"After the scans... I'm looking forward to my future and feel much more able to cope with the stresses of life. I'm much calmer, more positive, and more available to myself... and others."

:: About Brain Matters, Inc.

Mission Statement

Management

Investor Relations

Joint Venture Program

Employment

:: Other Links

Company Brochure

Office Tour

Videos

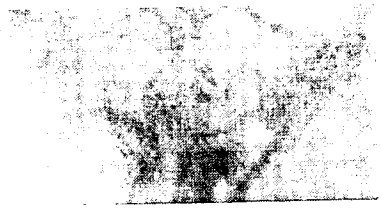
New Centers

Center Locations

Mission Statement

Brain Matters Imaging Centers is dedicated to enhancing the quality of people' lives by providing convenient nationwide access to state of the art brain functic imaging clinics. Our high resolution SPECT brain scans assist physicians & clinicians in properly evaluating, diagnosing, and treating their patients. Our comfortable clinics are staffed with caring, compassionate, professionals dedic to making a visit to one of our clinics enjoyable and rewarding for patients and families alike.

BRAIN MATTERS



:: Testimonials

Home :: Conditions :: Company :: SPECT :: Patient Info :: Contact

"After the scans, I felt peace of mind about my symptoms being real, able to see physical evidence of trauma that had occurred to me many years ago. I felt more aware of how my brain works and what it needs."

:: Conditions

ADD/ADHD

Alzheimer's Disease

Anxiety Disorder

Autism Spectrum Disorder

Bipolar Disorder

Depression

OCD

Traumatic Brain Injury

Seizure Localization

Stroke

:: News

Press

New Centers

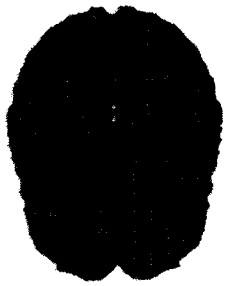
Get a Scan

No Interest Financing

Brain SPECT Imaging by

Brain Matters Imaging Centers...

See your Brain in Action



Normal

Brain SPECT Imaging by Brain Matters Imaging Centers utilizes the lates high-resolution brain SPECT imaging (Single Photon Emission Compute Tomography) to evaluate brain activity by tracing blood flow in the brain. Tracing blood flow allows us to observe the brain's actual metabolic proc and its activities.

By using a brain SPECT imaging scan to examine those areas of the brai that have too much or too little blood flow, we can determine which areas the brain are and are not functioning properly. Contrast this to MRI and C scans that typically show only structural brain abnormalities such as tun and lesions, and you can see why this is such an exciting new advance i field of brain imaging.

High resolution Brain SPECT Imaging can help in the assessment of:

- ADHD
- Alzheimer's Disease
- Anxiety Disorder
- Autism Spectrum Disorder
- Bipolar Disorder
- Depression
- OCD
- Traumatic Brain Injury
- Seizure Localization

:: Resources

Books to Read

Calendar of Events

Company Brochure

Office Tour

Videos

Google™

- **Stroke**

BRAIN MATTERS

"The scans opened the door for me to understand my symptoms, to see that what I'd been living with and thought was "normal", was not the best of me and my abilities."

ADHD - Attention Deficit Hyperactivity Disorder

:: Conditions
ADD/ADHD
Alzheimer's Disease
Anxiety Disorder
Autism Spectrum Disorder
Bipolar Disorder
Depression
OCD
Traumatic Brain Injury
Seizure Localization
Stroke
:: News
Press
New Centers
Get a Scan
No Interest Financing

Surface Views

Normal | **ADHD Attention Deficit Disorder** | **Normal** | **ADHD Attention Def Disorder**

You are not alone.

Attention Deficit Hyperactivity Disorder (**ADHD**) is the most commonly diagnosed behavioral childhood disorder, and the fastest growing diagnosed behavioral disor adults. Since 1990, the total number of American children diagnosed with **ADHD** h from (900,000) to over (5,500,000). There are approximately (1,000,000) new cas **ADHD** diagnosed yearly in children and (600,000) new cases per year diagnosed in the U.S. In fact, it is estimated that as much as 85% of the adult **ADHD** popula 50% of the pediatric population is currently undiagnosed.

Fifty percent or more of the school-aged population who have **ADHD** also have another behavioral disorder (known as "comorbidity"). Another 15-20% of ch display transient symptoms consistent with **ADHD**. Approximately half of all childr diagnosed with **ADHD** continue to manifest impairing symptoms throughout their a

Proper **ADHD** diagnosis can be challenging

Properly diagnosing **ADHD** can be a complicated proposition for clinicians for a nu reasons. **ADHD** actually comprises three (3) distinct subtypes of attention disorde separate sets of criteria that can and do occur in combinations of one another. Ma conditions also produce clinical symptoms similar to those disorders classified as and pose a problem in the differential clinical diagnosis of **ADHD**. To further hinde diagnostic process, several specific symptoms of **ADHD** match those of other syn and disabilities such as learning disabilities, petit mal seizures, anxiety and/or dep

Another problem related to accurate **ADHD** diagnosis is the presence of other cor conditions in **ADHD** patients. Studies have found that a large percentage of childr **ADHD** have or will develop Bipolar Disorder. It is imperative to know whether **ADH** existent with Bipolar Disorder for a patient. Why? Because if the **ADHD** is

treated BEFORE the Bipolar Disorder, the patient could experience severe manic episodes.

In light of the above, the diagnosis and treatment of **ADHD** has become extremely controversial. Some studies indicate that up to (20%) of children in some school d have been diagnosed with **ADHD**. In other school districts, the prevalence rate is (2%). This extreme variability strongly suggests the lack of a consistently applied and/or a lack of understanding of the basic biology of the disorder. Indeed, the Am Psychiatric Association has acknowledged that in studies it has performed, clinicia routinely misapply the established criteria for the diagnosis of **ADHD** as set-forth i Diagnostic and Statistical Manual of Mental Disorders (DSM), Volume IV. These s demonstrated that the accepted diagnostic criteria were used less than half of the

Finally, An Objective Evaluation Tool.

It is evident that current psychological diagnosis of **ADHD** leaves much to be desi that there is an urgent need for a more objective tool to assist in the evaluation of Brain SPECT Imaging has proven itself as an extremely effective tool in helping physicians to identify the presence (or absence) of **ADHD** dysfunction in both chil adults. It can also help to differentiate **ADHD** from other related conditions such a Disorder.

BRAIN MATTERS

Home :: Conditions :: Company :: SPECT :: Patient Info :: Contact

:: Testimonials

"The scans opened the door for me to understand my symptoms, to see that what I'd been living with and thought was "normal", was not the best of me and my abilities."

:: Conditions

ADD/ADHD

Alzheimer's Disease

Anxiety Disorder

Autism Spectrum Disorder

Bipolar Disorder

Depression

OCD

Traumatic Brain Injury

Seizure Localization

Stroke

:: News

Press

New Centers

Get a Scan

No Interest Financing

Alzheimer's Disease

Surface Views

Normal **Alzheimer's Disease**

A Dreaded Disease

Approximately 4,000,000 people in the U.S. have Alzheimer's disease. With th graying of the baby-boomer market, it is projected that this number will increas 14,000,000 by the year 2050. A recent study found that two-thirds of baby boo are personally concerned about getting Alzheimer's disease -- a sign that it mi replace cancer as this generation's most dreaded disease. Promising new dru therapies for Alzheimer's disease have been developed (and more are coming can slow the progression of the disease. All major medical groups in the U.S., as the American College of Radiology and the Society of Nuclear Medicine, recognize Brain SPECT Imaging as generally accepted for the identification of presence of Alzheimer's Disease once symptoms are suspected. Accordingly, third-party payors, including Medicare, provide reimbursement of Brain SPECT Imaging for suspected Alzheimer's Disease.

However, it is now becoming clear that for the new drugs to be most effective i imperative that the presence of Alzheimer's Disease patterns in the brain be fc early, BEFORE Alzheimer's symptoms are present. Accordingly, anyone with a history of Alzheimer's in their family should have an intense interest in early detection.

Detection prior to symptoms is the key to effective treatment.

Finally, An Objective Diagnostic Tool.

Research suggests that Brain SPECT Imaging can often identify the presence Alzheimer's disease and can be used as a screening tool several years before onset of symptoms of this devastating disease. With early detection, current a Alzheimer's drugs are showing promise in their ability to slow the progression this disorder and have been shown on SPECT to actually improve blood flow i affected parts of the brain. Slowing the progression of Alzheimer's disease giv patients a chance to take advantage of newly developing drug treatments that possibly further slow progression. It can also give them a chance to properly prepare themselves, their families and their affairs for the time when symptom

the disease begin to emerge.

BRAIN MATTERS

:: Testimonials

Home :: Conditions :: Company :: SPECT :: Patient Info :: Contact

"The scans opened the door for me to understand my symptoms, to see that what I'd been living with and thought was "normal", was not the best of me and my abilities."

:: Conditions

ADD/ADHD

Alzheimer's Disease

Anxiety Disorder

Autism Spectrum Disorder

Bipolar Disorder

Depression

OCD

Traumatic Brain Injury

Seizure Localization

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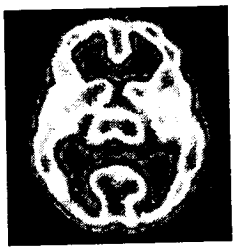
Anxiety & Panic Disorder

Inner Views



Normal

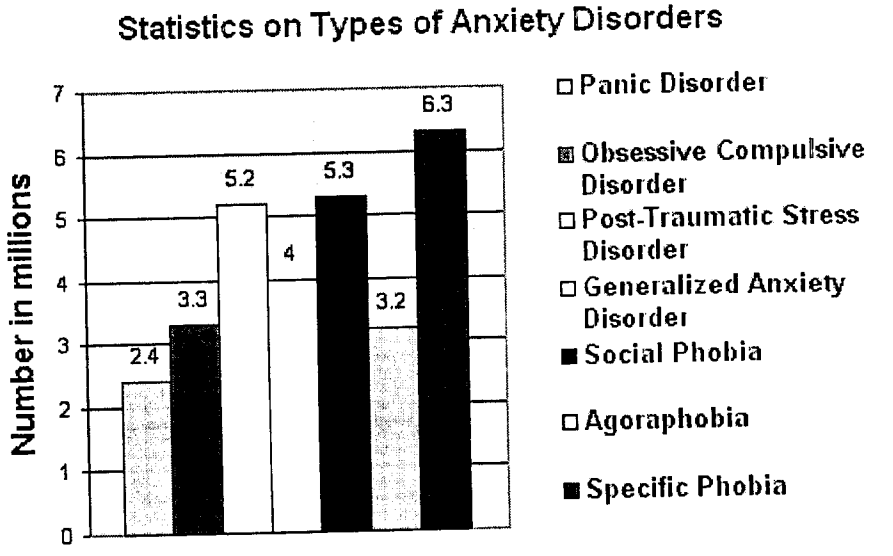
Anxiety & Panic Disorder

A challenge to diagnose

One in every eight Americans ages 18 to 54 suffers from an **anxiety disorder** totals over 19,000,000 people, making it the most common psychiatric conditic the U.S. **Anxiety Disorder** is actually comprised of seven different types of disorders (**Panic Disorder**, **Obsessive Compulsive Disorder**, **Post-Traumat Stress Disorder**, **Generalized Disorder**, **Social Phobia**, **Agoraphobia** and Specific Phobias) and is often co-occurring with other disorders such as depression, making it a very difficult disorder to properly diagnose and treat without diagnostic assistance. **Anxiety** sufferers see an average of 5 physician before being successfully diagnosed and treated.

Proper diagnosis leads to more effective treatment

The various types of anxiety disorders appear as brain dysfunction in different of the brain systems. By identifying these various dysfunctions as well as the presence or absence of other dysfunctions such as depression that may be complicating the condition, Brain SPECT Imaging can help identify the correct offending condition. This empowers physicians to more effectively correlate a patient's behavioral problems with the identified condition and create an effecti treatment plan that can be more readily accepted by the patient.



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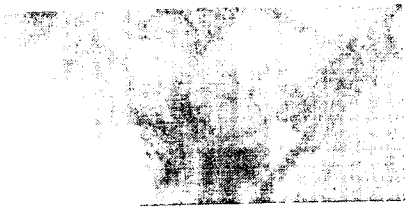

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"The scans opened the door for me to understand my symptoms, to see that what I'd been living with and thought was "normal", was not the best of me and my abilities."

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Autism Spectrum Disorder

Autism is a developmental disability that can severely impair an individual's ab to communicate and socially interact with others. It is four times more prevaler males than females. Currently, autism is believed to affect 1 in every 166 peop Although we do not yet know all the reasons why the rate of people being diagnosed with autism has increased substantially over the past two decades is thought to be due in part to improved diagnostic techniques and to changes the diagnostic criteria for "autism spectrum disorders".

Classic Autism (also known as Kanner's Autism or Syndrome), Asperger's Syndrome and Pervasive Developmental Disorder (PDD) are specific types of neurobehavioral complications classified within a group of developmental conditions known as "Autism Spectrum Disorders". Autism is considered a spectrum disorder because the number and intensity of the symptoms people autism display may vary widely. However, all individuals afflicted with autism demonstrate impairments to some degree in the following three areas: communication, social relationships and restricted patterns of behavior.

For example:

Social Interaction: A person with an autism spectrum disorder may not use o understand non-verbal communication, or (s)he may not develop peer relation that are appropriate to his or her developmental level. Often, there is a noticea lack of emotional reciprocity (you smile at him but he does not smile back). Ad with autism may appear aloof and indifferent to others; children seem to be wrapped up "in their own world".

Communication: There is a significant delay in, or a total lack of, speech development, with no corresponding attempts to communicate by gestures. Ar autistic individual may have difficulties in sustaining or initiating conversation o he may repeat his or her speech over and over again concerning the same top

Behavior and Interests: Restricted, repetitive and stereotyped patterns of behavior, interests and activities are a hallmark of autism. An individual with a or a related disorder may have an intense preoccupation with one subject area interest. The affected individual may have nonfunctional, rigid rituals or routine children, there is a lack of make-believe or social imitative play. Repetitive mot mannerisms (for example, hand flapping or spinning of objects) may also be present.

Below are some examples of behaviors that are characteristic of Autism Spectrum Disorders. An individual with autism may exhibit a combinatio or all of these behaviors, depending on where (s)he falls on the spectrur

- An infant does not imitate other children and/or does not reach out to th parents.
- A child does not develop age-appropriate peer relationships and has difficulty mixing with others.

- Little or no eye contact, aloof manner, appears detached, lacks spontar sharing of interests with others.
- Inappropriate attachments to objects, obsessive, odd play (for example, lining up or spinning toys).
- Resists changes in routine more than typically expected for a child his/h age.
- Eats only certain foods or insists on a preferred texture of clothing.
- Repetitive motor movements and/or demonstrates uneven fine and gro: motor skills development.
- Becomes stiff when held, does not liked to be touched, or is 'floppy' and low muscle tone.
- Does not develop speech or has speech and then loses it; does not poi gesture.
- Repeats words or phrases over and over again; talks only about narrow defined topics.
- Difficulty in discussing abstract concepts takes everything literally or ha: impaired language skills.

The Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) class a developmental condition within the group of Autism Spectrum Disorders as a "temporary episodic clinical disorder." This suggests that symptoms of these disorders vary in intensity and that with proper diagnosis and targeted treatme and rehabilitation, there is a possibility of improvement. The specific diagnose: used for autism and related disorders are:

Autistic Disorder (Classic Autism): Onset occurs before child is 3 years old. child shows impairment in the three areas of observable symptoms: difficulty ir communication, social interaction and repetitive, stereotyped patterns of beha\

Childhood Disintegrative Disorder: The child develops normally in all areas the first two years, then shows a significant loss of previously acquired skills.

Rett's Disorder (also known as Rett Syndrome): Found almost exclusively i females, the child achieves normal development for the first five months, then previously acquired communication skills and the purposeful use of the hands. These losses are soon followed by other areas of deterioration, including apra: (loss of ability to control complex muscle movements), gait disturbances and sometimes seizures. This disorder is very rare.

Asperger's Disorder (also known as Asperger's Syndrome): Children with disorder demonstrate average to above-average intelligence and no significan delay in language but show impairment in social interactions and have a restri range of interests and activities. These children often can be very talkative, although their speech tends to lack normal fluctuation of tone or prosody. They speak in a pedantic or lecturing tone.

Pervasive Developmental Disorder, Not Otherwise Specified (Atypical Autism): In the case of "PDD-NOS", there is significant impairment in the thre areas described above, but the child does not meet the full criteria for a specifi diagnosis.

TESTING FOR AUTISM SPECTRUM DISORDERS

At this time, there is no single diagnostic test that can conclusively prove a chil has an autism spectrum disorder. The most important signs to watch for are de in the development of speech and of reciprocal interactions between the child his/her caregivers. Parent's intuition is an important yardstick here, as well. If y feel that there is something going wrong with your child's development – trust intuition. This is because you may be picking up on subtle failures in your child

nonverbal communication with you.

There are several screening tools or checklists which can be useful in deciding whether to pursue further diagnostic workup. These include:

- CHAT – Checklist for Autism in Toddlers
- CARS Childhood Autism Rating Scale
- Autism Screening Questionnaire
- Screening Test for Autism in Two-Year Olds
- Social Reciprocity Scale

If a child demonstrates elements suggestive of an autism spectrum disorder, tl comprehensive evaluation is indicated. The standard clinical diagnostic tool in field is the ADOS (Autism Diagnostic Observation Schedule) which is a semi-structured assessment of communication, social interaction, and play or imaginative use of materials.

Other testing also is necessary to rule out other causes of neurological impairment and clarify the diagnosis.

- Hearing Tests. The first assumption most parents make when their chil speech problems or does not respond to aural stimuli is that their child r be deaf. A hearing test can indicate if a child has a hearing impairment. Tests can be performed on children even in infancy; audiologists measu responses such as blinking, staring or turning the head when a sound is presented.
- Genetic Testing involves using a blood test to screen for any genetic abnormalities that could cause developmental delays.
- Metabolic Screening consists of blood and urine tests to measure how a person is metabolizing food. Problems in this area can significantly imp child's growth and development resulting in symptoms similar to autism
- Electroencephalograms (EEGs) measure brain waves, and can uncove seizure disorders or other abnormalities.
- Head CTs and MRIs are helpful in detecting structural abnormalities. However, because most children with autism do not have structural abnormalities, these tests usually do not demonstrate specific structural abnormalities.
- Brain SPECT Imaging is a method to physiologically map and detail the regions of the brain which are impaired from functioning effectively. Sor autism treatment programs are using SPECT scans as part of a battery tests used in initial assessment and to track a child's improvements.

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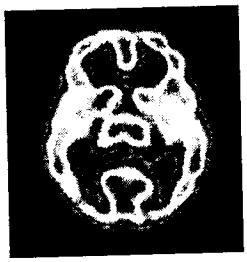

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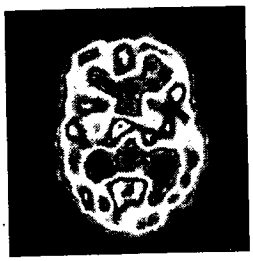

Bipolar Disorder

Commonly misdiagnosed.

Bipolar Disorder (also known as Manic-Depressive Illness) affects more than 2,300,000 American adults. Without effective treatment, the illness can lead to suicide in nearly 20% of cases.

Many patients with Bipolar Disorder are misdiagnosed. This occurs most often when a person with Bipolar II Disorder (the less severe form of the disorder), w hypomania is not recognized, is diagnosed with unipolar depression, or when a patient with severe psychotic mania is misjudged to have schizophrenia. Differentiating the initial onset of Bipolar Disorder from schizophrenia is often a extremely difficult diagnosis in acutely psychotic patients.

The psychosis and paranoia that accompany Bipolar Disorder increase the diffi of treatment compliance. It is often essential that family members be available encourage the patient to keep-up with medications. However, unless the assis family members fully understand and approve of the treatment plan, family members afraid of the stigma of mental illness and/or scornful of psychiatric medicine often collude with the non-compliance decisions of the patient.

Bipolar Disorder Treatment Challenges:

In addition, since Bipolar Disorder is usually quite responsive to medication, or the disorder improves, patients feel so normal they do not believe they ever ha chronic problem to begin with. So, they stop taking the medications, which will result in increasing the chances for relapse. This is actually one of the most significant problems in people diagnosed with Bipolar Disorder.

When a Picture is worth MORE than a thousand words.

Brain SPECT Imaging can provide objective assessment data that can be quite helpful in the physician's differential diagnosis of Bipolar Disorder. In addition, provide the patient and the patient's family members with graphic evidence tha Bipolar Disorder is a biological problem that can be effectively treated as such

Through this better understanding of the problem, both patients and family members are more likely to comply with and support treatment plans.

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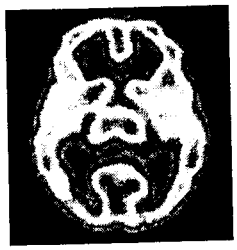

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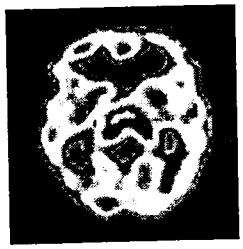

Depression

Depressive disorders are the second most pervasive psychiatric conditions in world (slightly second to anxiety disorders). They affect approximately 19,000, American adults. During their lifetime, approximately 5-12% of men and 10-15 women will have at least one episode of a major depressive disorder. More tha half of these people will have another episode of depression at some point in t lives. Twenty percent of patients visiting primary care physicians have depress symptoms.

The effects of depression are staggering. A recent study sponsored by the Wo Health Organization and the World Bank found major depression to be the lea cause of disability in the U.S. and worldwide. Eighty percent of suicides are ca out by persons who have depressive illness. Fifteen percent of people who ha significant mood disorders commit suicide.

Even though 80-90% of people with major depression can be treated successf only about a third of those seek help. The primary reason for this reticence is t stigma associated with admitting to emotional difficulties. Only 38% of Americ believe that depression is a "health" problem. These people view depression a personal weakness, not a medical illness.

Missing the Mark

The medical profession itself sometimes struggles with accurately diagnosing depressive disorders and other mood disorders. It has been reported that of th people with mood disorders that have sought help, 29% took over 10 years be receiving a correct diagnosis. And 60% of patients reported receiving an incor diagnosis before receiving the correct one. This problem is due in large part to fact that there is a high degree of variation among people with depression in te of symptoms, course of illness and response to treatment. This variability pose major challenge to clinicians attempting to understand and treat depression wi use of objective diagnostic testing tools.

Finally, Help & Hope

Brain SPECT Imaging can be a major help to physicians in their diagnosis and treatment of depressive disorders. Brain SPECT Imaging can show us whether parts of the brain that are generally believed to be involved in depressive disorders are working properly or not. Armed with this information, physicians can better correlate the patient's clinical symptoms and arrive at a diagnosis that is supported by objective diagnostic evidence. It has been our experience that the ability to visualize one's brain processes most often helps patients accept the existence of the diagnosed condition and enhances patient compliance with their treatment plans.

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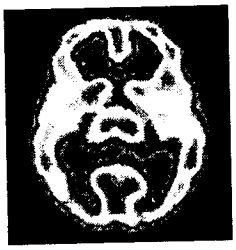
OCD - Obsessive Compulsive Disorder

Inner Views



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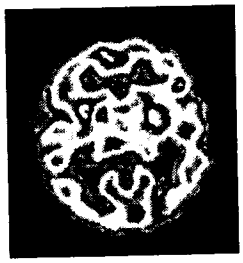

Obsessive Compulsive Disorde

One in fifty adults in the U.S. currently has OCD, and twice that many have ha some point in their lives. Fortunately, OCD is now very treatable.

What Is Obsessive-Compulsive Disorder?

Worries, doubts, superstitious beliefs all are common in everyday life. Howeve when they become so excessive or make no sense at all, then a diagnosis of (is made. In OCD, it is as though the brain gets stuck on a particular thought or and just can't let go. OCD is a medical brain disorder that causes problems in information processing. It is not your fault or the result of a "weak" or unstable personality. Research suggests that OCD involves problems in communicatior between the front part of the brain (the frontal lobe) and deeper structures (the basal ganglia). These brain structures use the chemical messenger serotonin. believed that insufficient levels of serotonin are prominently involved in OCD. I that increase the brain concentration of serotonin often help improve OCD symptoms. Brain SPECT images of the brain at work show that the brain circu involved in OCD return toward normal in those who improve after taking a serc medication or receiving cognitive-behavioral psychotherapy. When OCD starts suddenly in childhood in association with strep throat, an autoimmune mechan may be involved. This is known as PANDAS (Pediatric Autoimmune Neurologi Disorder Associated with Strep). There are lab tests that can determine the presence of this cause of OCD and, if present, this type of OCD can often be c by various treatments.

What are the symptoms of Obsessive-Compulsive Disorder?

OCD usually involves having both obsessions and compulsions, though a pers with OCD may sometimes have only one or the other. OCD symptoms can occ people of all ages. Not all Obsessive-Compulsive behaviors represent an illnes Some rituals (e.g., bedtime songs, religious practices) are a welcome part of d life. Normal worries, such as contamination fears, may increase during times c stress, such as when someone in the family is sick or dying. Only when sympt persist, make no sense, cause much distress, or interfere with functioning do t need clinical attention.

1. Obsessions
Obsessions are thoughts, images, or impulses that occur over and over again feel out of your control. You don't want to have these ideas, you find them disturbing and intrusive, and you usually recognize that they don't really make sense. You may worry excessively, be obsessed with singularly focused ideas have obsessive fears. These obsessions are accompanied by uncomfortable feelings, such as fear, disgust, doubt, or a sensation that things have to be do "just so."

2. Compulsions
People with OCD typically try to make their obsessions go away by performing compulsions. Compulsions are acts the person performs over and over again, according to certain "rules." Unlike compulsive drinking or gambling, OCD compulsions do not give the person pleasure. Rather, the rituals are performe obtain relief from the discomfort caused by the obsessions.

3. Other features of Obsessive-Compulsive Disorder:

- OCD symptoms cause distress, take up a lot of time (more than an hou day), or significantly interfere with the person's work, social life, or relationships.
- Most individuals with OCD recognize at some point that their obsession coming from within their own minds and are not just excessive worries a real problems, and that the compulsions they perform are excessive or unreasonable. When someone with OCD does not recognize that their beliefs and actions are unreasonable, this is called OCD with poor insig
- OCD symptoms tend to wax and wane over time. Some may be little m than background noise; others may produce extremely severe distress.

When does Obsessive-Compulsive Disorder begin?

OCD can start at any time from preschool age to adulthood (usually by age 40). One third to one half of adults with OCD report that it started during childh Unfortunately, OCD often goes unrecognized. On average, people with OCD s three to four doctors and spend over 9 years seeking treatment before they re a correct diagnosis. Studies have also found that it takes an average of 17 yea from the time OCD begins for people to obtain appropriate treatment. OCD ter be under-diagnosed and under-treated for a number of reasons. People with C may be secretive about their symptoms or lack insight about their illness. Man healthcare providers are not familiar with the symptoms or are not trained in providing the appropriate treatments. Some people may not have access to treatment resources. This is unfortunate since earlier diagnosis and proper treatment, including finding the right medications, can help people avoid the suffering associated with OCD and lessen the risk of developing other problen such as depression or marital and work problems.

What other problems are sometimes confused with OCD?

- Some disorders that closely resemble OCD and may respond to some same treatments are Trichotillomania (compulsive hair pulling), body dysmorphic disorder (imagined ugliness), and habit disorders, such as biting or skin picking. While they share superficial similarities, impulse control problems, such as substance abuse, pathological gambling, or compulsive sexual activity, are probably not related to OCD in any substantial way.
- The most common conditions that resemble OCD are the tic disorders (Tourette's disorder and other motor and vocal tic disorders). Tics are involuntary motor behaviors (such as facial grimacing) or vocal behavio (such as snorting) that often occur in response to a feeling of discomfor

More complex tics, like touching or tapping tics, may closely resemble compulsions. Tics and OCD occur together much more often when the or tics begin during childhood.

- Depression and OCD often occur together in adults, and, less commonl children and adolescents. However, unless depression is also present, people with OCD are not generally sad or lacking in pleasure, and peop who are depressed but do not have OCD rarely have the kinds of intrus thoughts that are characteristic of OCD.
- Although stress can make OCD worse, most people with OCD report th the symptoms can come and go on their own. OCD is easy to distinguis from a condition called posttraumatic stress disorder, because OCD is r caused by a terrible event.
- Schizophrenia, delusional disorders, and other psychotic conditions are usually easy to distinguish from OCD. Unlike psychotic individuals, peo with OCD continue to have a clear idea of what is real and what is not.
- In children and adolescents, OCD may worsen or cause disruptive behaviors, exaggerate a pre-existing learning disorder, cause problems attention and concentration, or interfere with learning at school. In many children with OCD, these disruptive behaviors are related to the OCD a will go away when the OCD is successfully treated.
- Individuals with OCD may have substance-abuse problems, sometimes result of attempts to self-medicate. Specific treatment for the substance abuse is usually also needed.
- Children and adults with pervasive developmental disorders (autism, Asperger's Disorder) are extremely rigid and compulsive, with stereotyp behaviors that somewhat resemble very severe OCD. However, those v pervasive developmental disorders have extremely severe problems rel to and communicating with other people, which do not occur in OCD. O small number of those with OCD have the collection of personality traits called Obsessive Compulsive Personality Disorder (OCPD). Despite its similar name, OCPD does not involve obsessions and compulsions, but rather is a personality pattern that involves a preoccupation with rules, schedules, and lists; perfectionism; an excessive devotion to work; rigid and inflexibility. However, when people have both OCPD and OCD, the successful treatment of the OCD often causes a favorable change in th person's personality.

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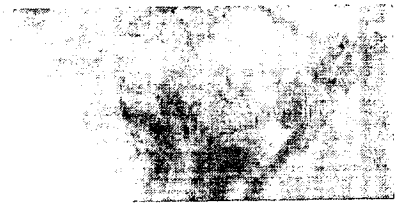

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What is a seizure?

A seizure is a sudden surge of electrical activity in the brain that usually affects a person feels or acts for a short time. Seizures are not a disease in themselve Instead, they are a symptom of many different disorders that can affect the bra Some seizures can hardly be noticed. Others are totally disabling.

A person who has had at least two seizures that were not caused by some kn medical condition like alcohol withdrawal or extremely low blood sugar is class has having epilepsy. The seizures in epilepsy may be related to a brain injury family tendency, but often the cause is completely unknown. The word "epilep does not indicate anything about the cause of the person's seizures or how se they are.

About half of the people who have one seizure without a clear cause will have another one, usually within a year. You are twice as likely to have another seiz you have a known brain injury or other type of brain abnormality. If you do hav seizures, there's about an 80% chance that you'll have more.

If your first seizure occurred at the time of an injury or infection in the brain, yo more likely to develop epilepsy than if you had not had a seizure in that situati

More than 1.5 million Americans have been treated for epilepsy in the last 5 ye That's 6.5 out of every 1,000 people.

Brain SPECT Imaging for the Detection of a Seizure focus.

A. Partial Complex Seizures/Temporal Lobe Epilepsy:
Seizures can be classified as either partial (focal) or generalized. Partial seizu originate in a given area of the brain and can be divided into simple (with no impairment of consciousness) and complex (with impairment of consciousnes Both simple and complex partial seizures may be preceded by sensations suc smells, tingling, or buzzing. About 10%-20% of patients with partial complex seizures have inadequate control on medical treatment. Patients unresponsive anti-convulsant therapy may be surgical candidates which can render the patie seizure free. Scalp EEG often fails to accurately localize the seizure focus and although depth EEG is much more accurate, it is also extremely invasive and suffers from regional under sampling. CT and MRI have low sensitivity for seiz foci detection, 17% and 34% respectively.

1) SPECT Imaging During Ictal Phase.
Brain SPECT imaging can localize the seizure focus in 80% to 100% of patien during the ictal (during seizure) phase. Ictal SPECT studies have reported sensitivities between 81% to 93% (sensitivity 89%-97% for temporal lobe epile and 73%-92% for neocortical epilepsy). The positive predictive value of SPEC imaging for localizing a unilateral seizure focus can be as high as 97%. Superimposition of SPECT images on MRI images can also aid in impro spatial localization.

2) SPECT During Inter-Ictal Phase.
Following a seizure, there is relatively rapid progression (generally within 20 minutes) to a lessened blood flow (hypoperfused) state which persists through the inter-ictal (seizure free) phase. SPECT studies performed during the inter-i phase will demonstrate an area of diminished activity at the seizure focus in up 50% to 70% of patients. The area of lessened blood flow (hypoperfusion) is oft much larger than the area of abnormality shown in the ictal phase.

Prognostically, patients with normal SPECT findings in the face of a localizing are at a higher risk for a poor surgical outcome. However, it is imperative to nc that a combination of a SPECT imaging finding of lessened blood flow (hypoperfusion) in the inter-ictal (seizure free) phase with more blood flow (hyperperfusion) in the same region on the SPECT ictal (during seizure) exam absolute specificity of the seizure focus.

B). Frontal Lobe Epilepsy:
In the evaluation of frontal lobe epilepsy, SPECT imaging has demonstrated a increased blood flow (hyperperfused) seizure focus during the ictal (during sei phase in 90% of cases.

C). Status Epilepticus:
Status epilepticus is a condition in which seizures occur either continuously or frequently that patients do not return to their baseline state between seizures. Although EEG can be very useful in the diagnosis, EEG abnormalities may be subtle or absent in these patients. In the evaluation of partial status epilepticus (during seizure) SPECT studies have demonstrated focal increased blood flow (hyperperfusion) in areas concordant with that suggested by EEG. Status epilepticus produces long term changes in regional brain blood flow that are nc evident following a single seizure. As a result of this, persistent increased bloo flow (hyperperfusion) may be observed by SPECT imaging for a prolonged pe of time (possibly out to 6 days following the event).

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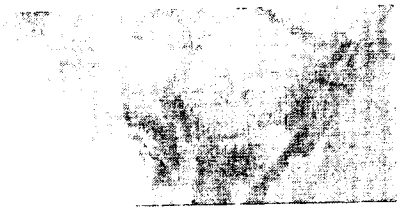

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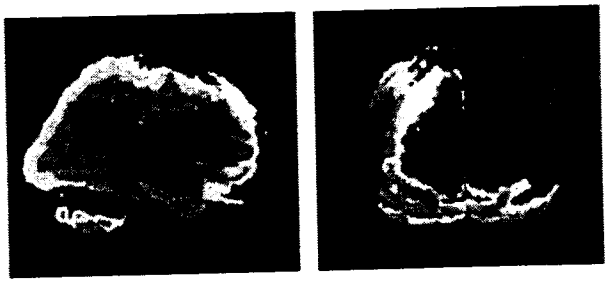


- About 700,000 Americans each year suffer a new or recurrent stroke. T means, on average, a stroke occurs every 45 seconds.
- Stroke kills nearly 164,000 people a year. That's about 1 of every 15 de It's the No. 3 cause of death behind diseases of the heart and cancer.
- About every 3 minutes, someone dies of stroke.
- Americans will pay an estimated $54 billion in 2005 for stroke-related medical costs and disability.

What is a stroke?

A stroke is damage (of any degree) to the brain caused by lack of blood flow ir brain blood vessels. Strokes occur when one on these blood vessels becomes blocked or damaged, preventing blood flow to a part of the brain.

Brain tissue depends on a continuous supply of oxygen and glucose to keep neurons (nerve cells) alive. During a stroke, brain tissue is cut off from its supp oxygen and within 3-4 minutes, neurons begin to die. Without immediate help, significant brain damage can occur. A stroke is a "brain attack". In a stroke, tim brain.

Kinds of stroke

There are two major categories of stroke. Hemorrhagic strokes occur when a weakened blood vessel in the brain leaks or ruptures. About 20% of strokes ar hemorrhagic. Ischemic strokes occur when blood vessels in the brain are bloc usually by a clot, but also by atherosclerotic narrowing. About 80% of strokes a ischemic.

What happens after a stroke?

The results of a stroke depend very much upon how much brain is damaged a what parts of the brain are damaged. Given that the brain is what controls our thoughts, emotions, actions, and our body, the after-effects of a stroke can influence a person's whole life. Effects can be subtle, such as memory impairn problems with thinking, or a change in emotional regulation. Effects can be all-encompassing, such as paralysis, loss of speech, or numbness.

Brain Attack !!

The symptoms of a stroke usually occur quickly and can include:

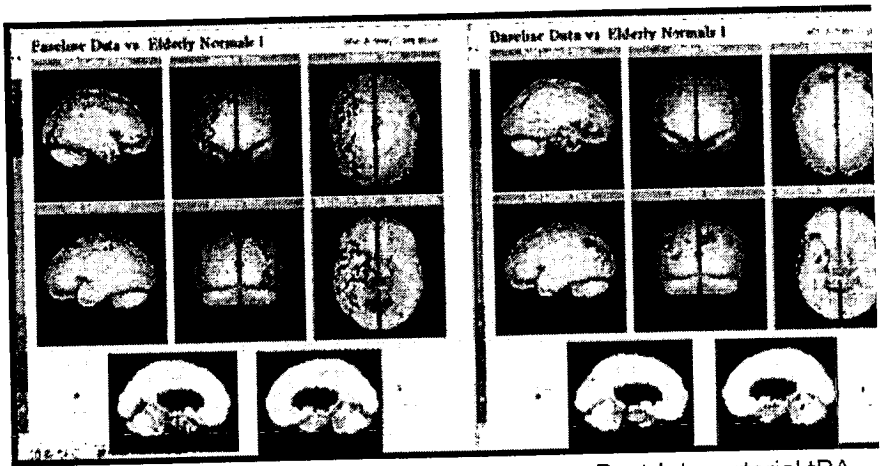
- sudden numbness or weakness in the face or body, especially if on one
- sudden confusion or sudden difficulty speaking or understanding speec
- sudden trouble seeing in one or both eyes
- sudden trouble walking, loss of balance or coordination, dizziness
- sudden severe headache with no known cause

A stroke is a medical emergency. The immediate response to seeing or experiencing any of the above symptoms is to call 9-1-1. The person should g the nearest hospital or emergency room that specializes in stroke treatment. Remember every minute that the brain is deprived of oxygen, more brain cells Time is brain.

Treatment for strokes

Hemorrhagic strokes need to be treated quickly to prevent damage not only d loss of blood flow to a part of the brain, but due to the pressure exerted by the leaking blood. As that volume of accumulated blood grows, it can compress ar damage other parts of the brain. Ischemic strokes can often be treated with angioplasty to open narrowed blood vessels or with clot dissolving agents. Recently, the FDA has approved intravenous tPA (tissue Plasminogen Activat a treatment for stroke. Intravenous tPA can often reduce the clot and therefore reduce the severity of a stroke. However, it must be administered within 3 hou be effective.

An exciting new development in the treatment of strokes may provide a few m precious hours to treat these devastating brain attacks. By threading a thin cat into the blocked blood vessel, it is possible the deliver the clot-busting agent, t directly into the blood clot. By use of intra-arterial tPA administration, physiciar can literally dissolve the clot and save as many as two-thirds of stroke patients ever suffering the devastating effects of a stroke. Brain SPECT imaging can pl important role in interventional stroke cases by providing quantitative informati that can identify the extent and severity of the stroke damage initially and track effectiveness of the initial intervention and follow-up treatments. This provides valuable prognostic information for both treatment and rehabilitation purposes.



Pre-Intra-arterial tPA Post-Intra-arterial tPA
(Patient Compared to Normative Database)
(Blue and Green denotes area of stroke)

What can I do to prevent a stroke?

- Smoking doubles your risk of a stroke. Find smoking cessation resourc your community. Don't start.
- High cholesterol doubles your risk of a stroke. Have your cholesterol checked and follow a low cholesterol diet.
- High blood pressure increases your risk of a stroke by 4-6 fold. Have yc blood pressure checked and control your blood pressure. If prescribed medication for blood pressure problems, make sure you always take yo medication.
- Heart disease increases your risk of a stroke by 6 fold. Follow your physician's recommendation concerning your heart disease.
- Heavy drinking of alcohol is associated with increased stroke rates. Lim your drinking. Get help, if you cannot control your drinking.
- Being overweight increases your risk of heart disease, high cholesterol, blood pressure, and diabetes – all of these increase your risk of a strok

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

The American Academy of Neurology,	)	Opposition No. 91168906
	)	
Opposer	)	Mark: BRAIN MATTERS
	)	
	)	Serial No. 78/321,810
v.	)	
	)	Filing Date: 10/31/2003
Brain Matters, Inc.,	)	
	)	
Applicant	)	Published: 12/20/2005

AFFIDAVIT OF CHARLES REED

Charles Reed, being duly sworn on oath, states as follows:

1. I am currently the Chief Business Development Officer for Brain Matters, Inc. I have held that position for about a year. Before that I was the Director of Business Development, beginning in August or September 2004. I am submitting this Affidavit in lieu of appearing for a testimonial deposition. I have first hand knowledge of the matters set forth in this Affidavit and, if called to testify, I would testify in response to appropriate questions as follows.

2. My responsibilities include managing the internet website and all internet applications. I am in charge of the business development tasks within the company and for the outside sales force. In addition, I oversee advertising, do all of the media buying, approve messages that go out, and produce television, radio and print advertisements.

3. Brain Matters, Inc. has a multi-pronged sales and marketing model aimed at medical professionals and consumers. Consumers include patients, prospective patients, their families and the general public.

4. The name Brain Matters Imaging Centers is used in print, TV and radio ads, and on the internet, signage, business cards, stationary, and business plans. The purpose of all advertising media is to obtain patients to have SPECT imaging scans for a fee.

5. In November 2003, Brain Matters, Inc. introduced an internet website using the domain name www.brainmattersinc.com. The content of the website has changed over time and an excerpt of the website's content in its present form is attached as Exhibit 1 to the affidavit of John Goodhue. The purpose of the website is to obtain patients to have SPECT imaging scans for a fee. To the extent that the website contains information about various medical and psychiatric illnesses that may be diagnosed by the imaging, it does so in order to obtain patients to have SPECT imaging scans for a fee.

6. At the top of each page of the internet website, the name "Brain Matters"is accompanied by the term "Imaging Center" and the company's logo. "Brain Matters" is not used in isolation on the website, thus eliminating the risk of any possible confusion with the mark "The Brain Matters." See Exhibit 1 to the Affidavit of John Goodhue.

7. I am not aware of any member of the public confusing the advertising, services, website, or name of Brain Matters, Inc. with that of the AAN, including the AAN's website, www.thebrainmatters.org, at any time since I began working at Brain Matters, Inc.

8. To my knowledge, no person has ever called or otherwise communicated with Brain Matters, Inc. asking whether there is or was a relationship between the AAN and Brain Matters, Inc. I am not aware of any member of the public confusing the mark "Brain Matters" with the mark "The Brain Matters."

9. In 2006, Brain Matters, Inc. spent approximately $670,000 advertising and promoting its mark "Brain Matters" in connection with SPECT brain imaging services.

10. Exhibits 2 through 6 are true and correct copies of a representative sample of Brain Matters, Inc.'s advertising. In all of them, Brain Matters, Inc. states that its function is to provide brain imaging.

11. When potential patients first call Brain Matters, Inc., they are referred to patient care coordinators. The purpose of patient care coordinators is to schedule patients for SPECT imaging scans, explain the protocols surrounding the procedure, field questions and inquiries from potential referral sources, and collect money from patients, among other things.

12. When prospective patients first call Brain Matters, Inc., patient care coordinators ask them how they heard about the company and the SPECT imaging scans, among other things. Their responses are placed into a practice management system that tracks the referral sources of patients and prospective patients.

13. Exhibit 7 is a true and correct copy of a document titled "Patient Referral Sources." I prepared that document based on information placed into the practice management system by the patient care coordinators. That information is kept in the ordinary course of business. The records are prepared by people who have first-hand knowledge of the information, at or near the time the information is received and it is the regular practice of Brain Matters, Inc. to keep such records. I am the custodian of the records placed into the practice management system and the practice management system itself.

14. Exhibit 7 reflects a seven month sample of the referral sources for potential patients from March 2006 to November 2006. It includes the percentages of potential patients from various sources. The percentages include both people who

become patients and those who do not. To the best of my knowledge, the information on Exhibit 7 is true and correct as it relates to that time period.

May 16, 2007

Charles Reed

Subscribed and sworn before me this 16th day of May, 2007 by Charles Reed.
Witness my hand and official seal.

Notary Public

KARLA M. SCHOEN
NOTARY PUBLIC
STATE OF COLORADO
MY COMMISSION EXPIRES 2/26/2009

EXHIBIT 2

☐ Quality Control Proof
☐ Outside First Proof
☐ Outside Second Proof
☐ In-House / To Sales Only

[redacted]

SP109248

Start Date: -
Last User: Noami Foster
Wed, June 28, 2006 - 11:50:18 AM

Size:: 3 x 5" – Actual Size: 5.729" x 5"

Brain Matters
Heidi Menard
Alexandra Arellano

Ins. Date	Pub.	Sect.	Loc.

EXHIBIT 3

☐ Quality Control Proof
☐ Outside First Proof
☐ Outside Second Proof
☐ In-House / To Sales Only

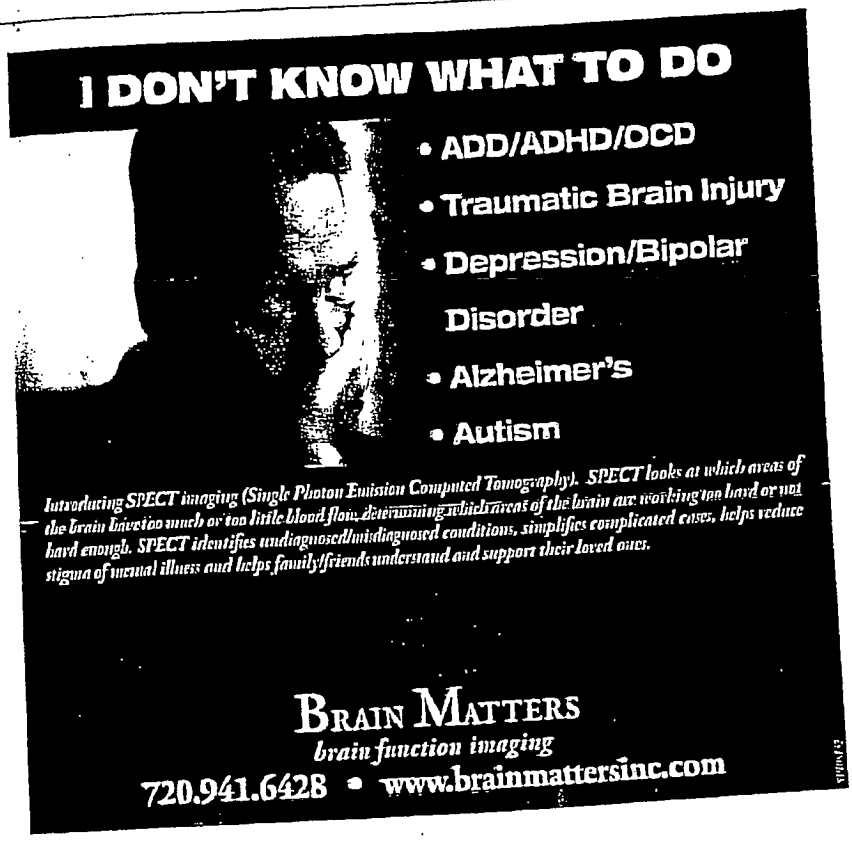
SP109241

Start Date: -
Last User: Noami Foster
Wed, June 28, 2006 - 11:24:04 AM

Size:: 3 x 5" – Actual Size: 5.729" x 5"

Brain Matters
Heidi Menard
Alexandra Arellano

Ins. Date | Pub. | Sect. | Loc.



BMI 00051

EXHIBIT 4

EXHIBIT D

YELLOW PAGE AD FROM 2003

SPEC AD

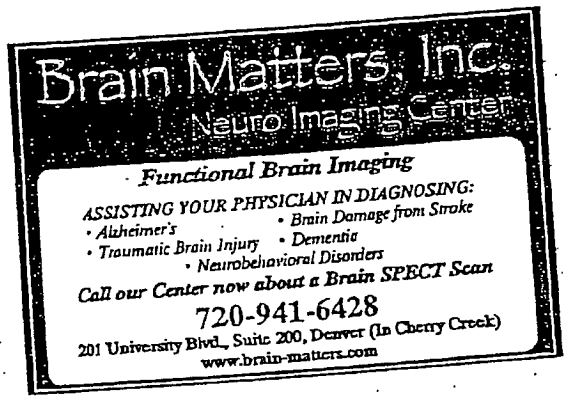
THIS AD WILL NOT APPEAR

Ads that contain co
directory because

tDex 2

inted
nks.

Directory: Denver YP
Heading: Alzheimer's Information & Treatment
Sales Consultant: John Strine, Aurora



Modified: Wednesday, August 27, 2003, 4:20 PM by L. Leber

PLEASE DO NOT WRITE BELOW THIS LINE.

60569611 DNV O02P 9416428 408508

EXHIBIT 5

60-sec ads: bullet points

1. Before scan

- You're excited about getting your brain scanned at Brain Matters Imaging Centers.
- A SPECT scan will track the function in every region of your brain by tracking blood flow, and show you pictures of how your brain is working.
- Symptoms you experience make you aware there may be a problem, and you are curious about the nature of the problem.
- Symptoms may affect your ability to function at your best
- You may believe you know what the problem is, based on your symptoms, but the same symptoms can come from a lot of different brain processes.
- Fears about the scan may include that the camera is enclosed like in an MRI scan or that it will be noisy.
- The procedures are recognized by the American College of Radiology and Society of Nuclear Medicine.
- The clinic is supervised by and the scans are interpreted by board certified medical doctors
- Accepting most insurance plans and affordable, zero percent financing for those without insurance,.
- Brain Matters Imaging Centers www.seeyourbrain.com 303-623-1179

2. After scan

- Pleasant customer service experience at clinic; reassuring staff; astute clinician and highly skilled technologist.
- Painless, easy scan process (not confined)
- Difference between SPECT and MRI's and CT's
    - MRI's and CT scans show structural damage
    - SPECT scans track blood flow through every region in the brain, which is directly related to function of those regions.
    - Provides a more thorough picture of what's going on in your brain.
    - There is often more than one issue identified. ADD/ADHD can be accompanied by brain injury, anxiety, or bipolar disorder.
    - A medication that may be right for one condition, but might make another condition worse.
    - A brain SPECT scan enables your doctor to accurately identify abnormal brain function, so your treatment can address exactly what will benefit you the most.
- SPECT scans are used to help detect the brain processes that underlie ADD/ADHD • Traumatic Brain Injury • Autism • OCD • Anxiety • Depression • Bipolar Disorder • Alzheimer's • Stroke • Seizure
- Accepting most insurance plans and affordable, zero percent financing for those without insurance,.
- Brain Matters Imaging Centers www.seeyourbrain.com 303-623-1179

3. After Review

- Review process in general
  - Presentation of information
- What you learned about how your brain works
- You can actually now see what is going on in your brain
  - How the results differed from what you thought was going on based on your symptoms
- How you and your doctor can use this information to optimize your treatment plan going forward
- Accepting most insurance plans and affordable, zero percent financing for those without insurance,.
- Brain Matters Imaging Centers www.seevourbrain.com 303-623-1179

30-sec ads; scripts

1.

BOYLES Are you constantly anxious? Forgetful? Depressed? Do you have trouble focusing your attention or controlling your behavior? Hi, I'm Peter Boyles. These are all symptoms of a brain struggling to work efficiently. You and your doctor can obtain scientific, reliable information on how your brain is working with a brain-function SPECT scan at Brain Matters Imaging Centers. Don't just treat the symptoms, treat the problem. Find out more by calling 303-623-1179 or online at seeyourbrain.com. Brain Matters 303-623-1179.

2.

BOYLES: Maybe your child has learning difficulties…or your spouse has unpredictable mood swings. Maybe you are anxious or depressed. Hi, I'm Peter Boyles. These symptoms and others

are caused by abnormal brain function. A SPECT brain scan from Brain Matters Imaging Centers helps pinpoints the cause and gives your doctor reliable information to optimize your treatment. Don't just treat the symptoms, treat the problem. Find out more by calling 303-623-1179 or online at seeyourbrain.com. Brain Matters Imaging Centers.

3.
BOYLES: When is a brain scan helpful?" The answer...when you need to know "why." A brain-function SPECT scan from Brain Matters Imaging Centers shows blood flow in brain regions which directly correlates with brain activity patterns, enabling doctors to see which areas are over or under active. Before you set a broken arm, you take an X- ray. Before you treat anxiety, depression, attention and learning problems, you need a clear picture of what's going on in the brain. Are you a candidate for a SPECT scan? Find out by calling 303-623-1179 or online at seeyourbrain.com. Brain Matters Imaging Centers.

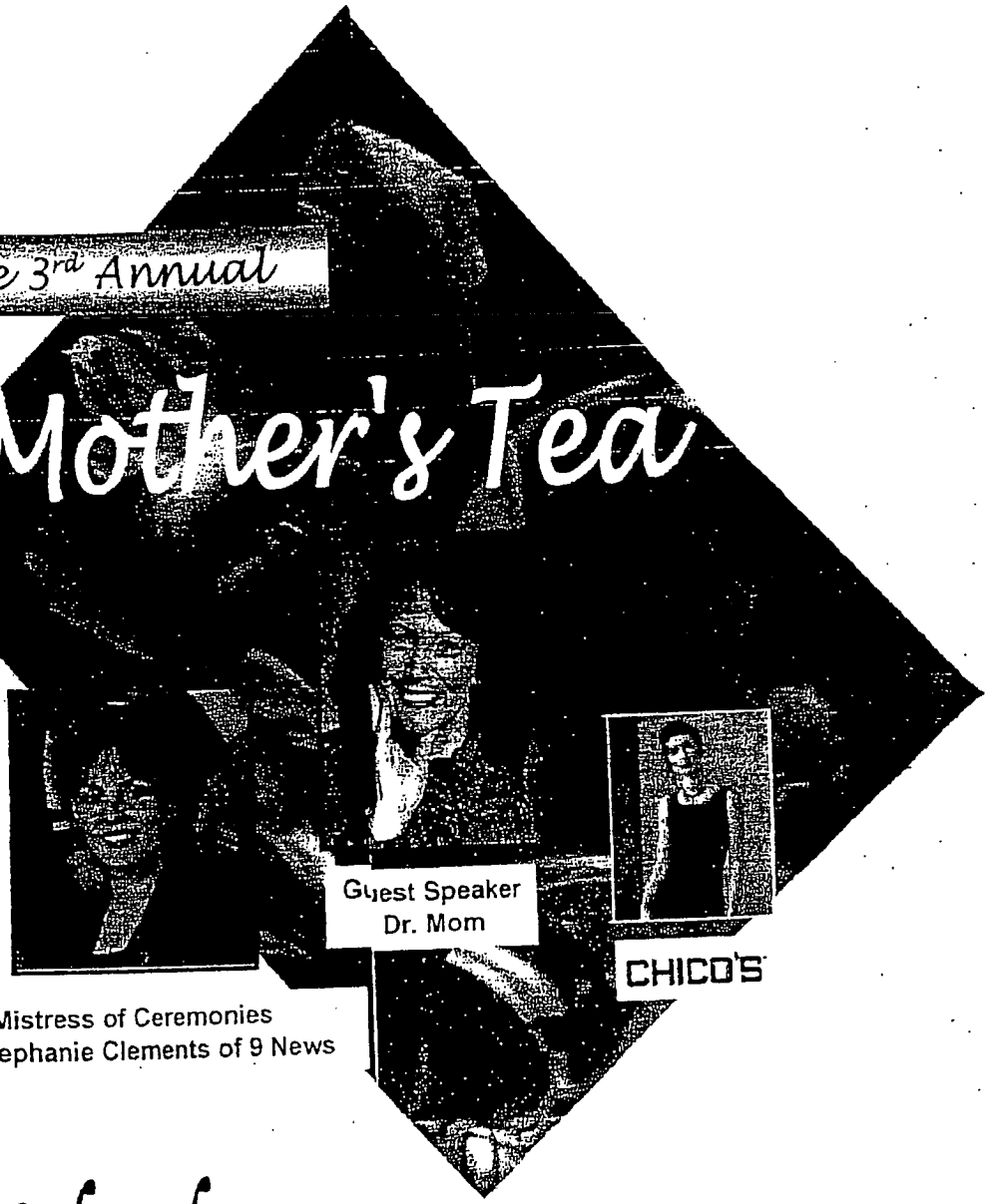
EXHIBIT 6

Cerebral Palsy
of Colorado invites

BRAINMATTERS
brain function imaging

To the 3rd Annual

Mother's Tea



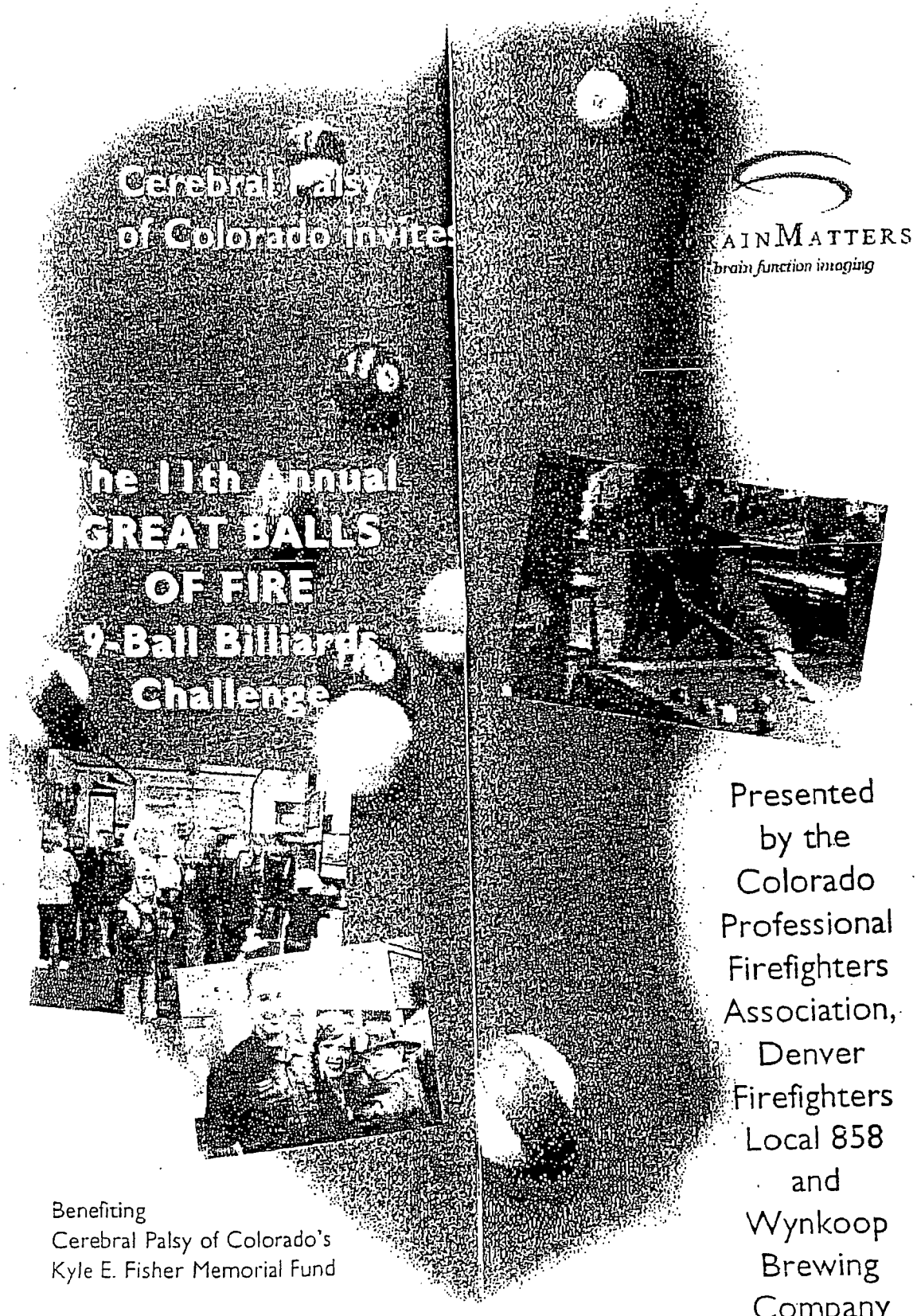
Guest Speaker
Dr. Mom

CHICO'S

Mistress of Ceremonies
Dr. Stephanie Clements of 9 News

CP of Colorado ...Uniting Communities & People!

BMI 00598


Cerebral Palsy
of Colorado invites
you to
the 11th Annual
GREAT BALLS
OF FIRE
9-Ball Billiards
Challenge
BRAINMATTERS
brain function imaging
Presented
by the
Colorado
Professional
Firefighters
Association,
Denver
Firefighters
Local 858
and
Wynkoop
Brewing
Company
Benefiting
Cerebral Palsy of Colorado's
Kyle E. Fisher Memorial Fund
BMI 00599

Cerebral Palsy of Colorado invites

BRAINMATTERS
brain function imaging

Swing with the Legends

Brooks Robinson

Celebrity Host
Brian Fisher

"Goose" Gossage

At the 8th Annual
CP of COLORADO GOLF CLASSIC
July 11 and 12, 2004

Held at the Prestigious Valley Country Club

Presented by Coors

BMI 00600

MAJOR LEAGUE BASEBALL® PLAYERS ALUMNI

Actual Players not yet determined by The MLBPAA

Cerebral Palsy of Colorado invites

to join us as we Celebrate

BRAINMATTERS
brain function imaging

The 21st Annual Wine in the Pines

BMI 00601

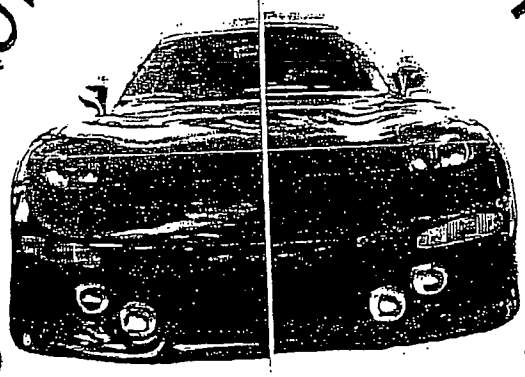
at Keystone Resort
October 22 and 23, 2004

Cerebral Palsy of Colorado
invites

BRAINMATTERS
brain function imaging

To The
21st Annual

EXOTIC SPORTS CAR SHOW AND CONCOURS D'ELEGANCE



June 6, 2004

at Arapahoe Community College

BMI 00602

EXHIBIT 7

10/11/2006

Patient Referral Sources

Print Media	6.76%
Attorney	0.40%
Radio Ad	0.37%
Walk In	0.69%
Website	17.40%
Television Ad	53.71%
Trade Shows/Conferences/Speaking Engagements	0.64%
Yellow Pages	0.08%
Physicians	10.88%
Unknown	0.74%
Word of Mouth	8.33%

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

The American Academy of Neurology,	)	Opposition No. 91168906
	)	
Opposer	)	Mark: BRAIN MATTERS
	)	
	)	Serial No. 78/321,810
v.	)	
	)	Filing Date: 10/31/2003
Brain Matters, Inc.,	)	
	)	
Applicant	)	Published: 12/20/2005

AFFIDAVIT OF JULIE BANTA

Julie Banta, being duly sworn on oath, states as follows:

1. I am the Director of Patient Care Coordination for Brain Matters, Inc. I have held that position for a year and a half. Before that, I was a patient care coordinator since I joined the company in March 2004. I am submitting this Affidavit in lieu of appearing for a testimonial deposition. I have first hand knowledge of the matters set forth in this Affidavit and, if called to testify, I would testify in response to appropriate questions as follows.

2. As a patient care coordinator, I scheduled patients for SPECT imaging scans, explained the protocols surrounding the procedure, fielded questions and inquiries from potential referral sources, and collected money from patients, among other things.

3. Now, in addition to performing those functions, I supervise others who perform the same tasks.

4. When prospective patients first call Brain Matters, Inc., patient care coordinators ask them how they heard about the company and the SPECT imaging scans, among other things. Their responses are placed into a practice management system that tracks the referral sources of patients and prospective patients, among other things. That process is done in the ordinary course of business, prepared by people who have first-hand knowledge of the information. It is prepared at or near the time the information was received and it is the regular practice of Brain Matters, Inc. to keep such records.

5. I am not aware of any member of the public confusing the advertising, services, website, or name of Brain Matters, Inc. with that of the AAN, including the AAN's website, www.thebrainmatters.org, at any time since I began working at Brain Matters, Inc.

6. To my knowledge, no person has ever called or otherwise communicated

with Brain Matters, Inc. asking whether there is or was a relationship between the AAN and Brain Matters, Inc. I am not aware of any member of the public confusing the mark "Brain Matters" with the mark "The Brain Matters."

May 16, 2007.

Julie Banta

Subscribed and sworn before me this 16th day of May, 2007 by Julie Banta.
Witness my hand and official seal.

Notary Public

LA M. SCHOEN
OTARY PUBLIC
E OF COLORADO
MISSION EXPIRES 2/26/2009

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

The American Academy of Neurology,	)	Opposition No. 91168906
	)	
Opposer	)	Mark: BRAIN MATTERS
	)	
	)	Serial No. 78/321,810
v.	)	
	)	Filing Date: 10/31/2003
Brain Matters, Inc.,	)	
	)	
Applicant	)	Published: 12/20/2005

AFFIDAVIT OF NANCY GOODHUE

Nancy Goodhue, being duly sworn on oath, states as follows:

1. I am and have been the Chief Clinical Officer and Clinical Director of Brain Matters, Inc. since it began. I am submitting this Affidavit in lieu of appearing for a testimonial deposition. I have first hand knowledge of the matters set forth in this Affidavit and, if called to testify, I would testify in response to appropriate questions as follows.

2. I suggested that the company be named "Brain Matters." At the time I suggested the name, I had never heard of it before. I was not aware that the American Academy of Neurology owned a trademark, "The Brain Matters," or owned a website with a domain name of www.thebrainmatters.org. I had no intent to compete with the registration or use of the mark "The Brain Matters" and I had no intent to trade on the goodwill associated with that mark, if any.

3. I believed that the name was an appropriate choice because it has the connotation of "all matters related to the brain." I did not think in terms of the physical components of the brain.

4. I was not part of the discussions or analysis relating to whether the name should be adopted. I played no role in that decision. I played no role in the mechanics of registering the name, whether as a trademark or otherwise.

5. I am not aware of any member of the public confusing the advertising, services, website, or name of Brain Matters, Inc. with that of the AAN, including the AAN's website, www.thebrainmatters.org, at any time since I began working at Brain Matters, Inc.

6. To my knowledge, no person has ever called or otherwise communicated

with Brain Matters, Inc. asking whether there is or was a relationship between the AAN and Brain Matters, Inc. I am not aware of any member of the public confusing the mark "Brain Matters" with the mark "The Brain Matters."

May 16, 2007.

Nancy Goodhue

Subscribed and sworn before me this 16th day of May, 2007 by Nancy Goodhue.
Witness my hand and official seal.

Notary Public

KARLA M. SCHOEN
NOTARY PUBLIC
STATE OF COLORADO

MY COMMISSION EXPIRES 2/26/200

THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

The American Academy of Neurology,

Opposer,

vs.

The Brain Matters, Inc.,

Applicant.

Opposition No. 91168906

Mark: BRAIN MATTERS

Serial No. 78/321,810

Filing Date: 10/31/2003

Published: 12/20/2003

The 30(b)6 and personal capacity Deposition of MELANIE HOFFERT, taken pursuant to Notice of Taking Deposition, taken before Ann Marie Holland, a Notary Public in and for the County of Washington, State of Minnesota, taken on the 18th day of January, 2007, at the Law Offices of Oppenheimer, Wolff & Donnelly, LLP, PLaza VII, Suite 3300, 45 South Seventh Street, Minneapolis, Minnesota, commencing at approximately 12:40 p.m.

APPEARANCES:

DAVID A. PRANGE, ESQUIRE, of the Law Firm of OPPENHEIMER, WOLFF & DONNELLY, LLP, Plaza VII, Suite 3300, 45 South Seventh Street, Minneapolis, Minnesota 55402-1609, (612) 607-7263, e-mail: dprange@oppenheimer.com, for and on behalf of the Opposer.

CAROLE K. JEFFERY, ESQUIRE, of the Law Firm of GARLIN, DRISCOLL & HOWARD, LLC, 245 Century Circle, Suite 101, Louisville, Colorado 80027, (303) 926-4222, e-mail: cjeffery@gdhlaw.com, appeared for and on behalf of the Applicant.

The Original is in the possession of Attorney Carole K. Jeffery.

* * *

MELANIE HOFFERT:

EXHIBITS

*Exhibit 41 is marked "Confidential."

MELANIE HOFFERT,

the 30(b)6 and personal capacity Witness in the above-entitled matter after having been first duly sworn deposes and says as follows:

EXAMINATION

BY MS. JEFFERY:

Q. How are you employed?

A. Pardon?

Q. How are you employed?

A. How am I employed?

Q. Yes. What is your job?

A. I am the director of the marketing communications and digital division at the American Academy of Neurology.

Q. Is that the MCD?

A. The MCD group, uh-huh.

Q. How long have you been there?

A. I have been there five years, approximately. A little bit more.

Q. Have you had that position the whole time?

A. No, actually. Would you like to know?

Q. Yes.

A. I started as the manager of web development.

Q. I'm sorry, what development?

A. Web development. And from there I became the senior manager of a group called the creative development group. And after that position I got the position of the director.

Q. What did you do before you went to AAN?

A. Directly before the academy I worked at a web consulting company, and I was a producer there.

Q. When did you start at that company? What is the name of that company?

A. That was called Connecting Images.

Q. When did you start working at Connecting Images?

A. Approximately -- I was there for a year, so. In 2000 or so.

Q. What were you doing before that?

A. Prior to that I was working at a company called Spherion. And I was a consultant there as well, doing information design.

Q. Could you spell the name of that company for me?

A. Spherion, S -- I have to use a pen. S-P-H-E-R-I-O-N. They changed their name halfway through, so.

Q. How long were you there?
A. I was there for two years. I'm sorry, a year.
Q. So that takes us to about 1999?
A. Yes.
Q. What did you do then?
A. Then prior to that I worked at a place called the International Decision Systems. There I was a technical writer and an instructional designer.
Q. What is an instructional designer?
A. Putting together training materials for software and others. So it is a training.
Q. How long were you there?
A. I was there for two years.
Q. What did you do before 1997?
A. Before that I worked at a place called Great Plains Software. That was when I was going to school. So I was in school for, you know, four years.
Q. When did you graduate?
A. In '97.
Q. Where did you go to school?
A. Concordia College in Moorehead, Minnesota.
Q. What is your degree in?
A. My degree is in English, with a minor in communications and women's studies.
Q. Do you have some computer background?

A. In so far that I worked at the computer software companies.

Q. The companies?

A. Yeah, a couple of software companies. Most of my positions have involved technology in some way.

Q. What is your experience with web development?

A. Primarily with web development it has been doing the content development and managing the whole process from beginning to end. Including the positioning of the websites, working with the clients, working with designers, programmers. So I have not done actual programming per se.

Q. Is that what you do at AAN?

A. That is one part of what I do, yes.

Q. What is the other part?

A. I -- let's see. I guess that's a fifth of what I do, the digital group, where we do all of the web development. I also manage the writing and design group, which does the content development and works on all of our publications and our -- the design of our logos and stuff like that.

Another part is that I manage the media and public relations group. Of course that is media and public relations. And finally, I manage the marketing group.

Q. Have you held all of those positions for five years?

A. Well, this is -- this is under the MCD what I currently do.

Q. Okay. I just want to know has that been full-time that you were there?

A. No, this was within the last two years. Since I assumed the director position, yes.

Q. Are you familiar with the background of AAN?

A. The organization?

Q. Yes.

A. I am familiar with it.

Q. Okay.

MS. JEFFERY: Mark this, please.

(HOFFERT Deposition Exhibit 10 marked for identification.)

BY MS. JEFFERY:

Q. Can you identify Exhibit 10?

A. It is the -- it looks like the organizational structure of AAN, the Foundation and AEI.

Q. What is AEI?

A. AEI, American Academy of Enterprises, Inc.

Q. So the overall structure is the AAN organization? I mean the main entity is AAN?

A. The main entity is AAN, although AEI and the Foundation are technically separate organizations.

Q. Okay. I think we have separate charts for

those as well?

A. Yes.

Q. What is marketing communications/digital? What does it do?

A. The marketing communications and digital group provides essentially marketing communications and digital services to the rest of the organization. So we are similar to maybe an outside agency, creative agency, public relations agency, and web development company, but we are internalized.

Q. What about AEI, what does that do?

A. AEI is our for profit subsidiary, so they sell products and services for the organization.

Q. And what is AAN Press?

A. AAN Press is our publishing wing. So under AAN Press we publish several different publications, including our journal and tabloid publication and book series.

Q. And AAN Partner Programs?

A. AAN Partner Programs are member benefit programs. So we would potentially work or endorse a good deal for our members, so at a discounted rate they would be able to get a discounted rate through the academy I should say.

Q. And AAN store and catalog?

A. That is essentially the vehicle through which

we offer products and services to our members. So we actually put together a product catalog every year and we have a store at the annual meeting where we are selling practice tools and novelty items.

Q. And those are things that are sold directly by AAN; not a partner?

A. Correct.

Q. How about AANF, what is that entity?

A. That is the Academy's Foundation.

Q. Is that organization reflected on the page numbered AAN 00094?

A. Yes.

Q. Can you describe the structure to me?

A. Yes. The Foundation is governed by the board of trustees, obviously. Catherine Rydell is the executive director. She is also the executive director of the academy. Linda Morgan is the interim or acting Foundation director. And under there are the different staff that make up the Foundation.

Q. Who is Melissa Thayer (phonetic)? She was an assistant to Linda Morgan?

A. Yes.

Q. How big is the organization?

MR. PRANGE: Objection. Just which organization?

Q. I mean AAN itself? I am not talking about members, but I mean the organizational structure?

A. The organizational structure, including the two entities that we have just talked about, the Foundation and AEI is approximately 110 employees I believe.

Q. How does that break down among the three entities?

A. (Reviewing.) The Foundation has five people. So that makes them and AEI has approximately four to five employees. So the academy really makes up the majority.

Q. Let's look at the MCD organizational chart on Page AAN 00093. Can you describe to me the overall structure of MCD?

A. Yes. I have to of course report to Cathy Rydell. And I am the director. Heather Kittleson (phonetic) is the manager of the writing and design group, which does the graphics and produces the copy for all of our publications, marketing materials, website, et cetera. Jason Kopinski manages the digital group, which includes the programmers and database administrator and a designer. And Arlene is the manager of the marketing group, which has one person, so they do all of the planning for the organization, in terms of marketing. And finally Robin Stinnett is manager of the media public relations group, so that is working with the media and external entities.

Q. Is MCD the largest portion of the academy itself?

A. I do not know for sure, but I don't think so.

Q. Do you have an outside advertising agency that you work with?

A. Not currently.

Q. Marketing company?

A. No.

Q. You do all of it in-house?

A. Yes.

(HOFFERT Deposition Exhibit 11 marked for identification.)

BY MS. JEFFERY:

Q. Can you identify this document?

A. It looks like it is a presentation of some sort.

Q. Okay. What is Brain Matters?

A. The "Brain Matters" is our -- essentially our public -- public education, public campaign that we have had over the last several years.

Q. And how long?

A. Well, according to this document, it looks like it began in '94, which was before my time, so I'm not exactly sure if that is the case.

Q. Okay. Are you familiar with the history and

how it all began?

A. I am familiar with it.

Q. Even though you are not with the document in particular?

A. Right.

Q. When it says, "the process began in 1994," is that AAN or is that the public education program that you just referred to?

A. I would assume it is referring to the public education program, the "Brain Matters."

Q. What can you tell me about the public education program "Brain Matters"?

A. Specifically do you have any questions? I'm sorry.

Q. Yes. When did it start? It looks like '94?

A. '94.

Q. How did it come about?

A. From what I understand the -- well, the public education of the Brain Matters fulfills both the mission of the academy and of the Foundation, which is of course to contribute to the art and science of neurology and help patients and people afflicted with neurological diseases.

So I believe it began as an education campaign and to target and reach those audiences in many different ways.

Q. What would you describe as the audience?

A. The specific audience is that, at least that I have been familiar with over the last several years, include people who are obviously interested in neurology, those affected with a neurological condition, which would include patients, caregivers, people who know someone with a neurological condition. Also target audiences have or are our members. Other specialties that would have an interest in neurology, including primary physicians, who refer their patients to neurologists, patient advocacy groups, and other, I guess, allied healthcare professionals.

Q. Do you also focus on or direct your materials to public policy makers?

A. Yes.

Q. Do you keep track of who it is that actually accesses your information? First your website?

A. We have web statistics that can tell us limited information on that. And when we have done promotional campaigns in the past, we have put on aliases, for example, so we can try to pinpoint where those ads have run and who most likely would have seen them.

Q. Do you have documentation that shows that?

A. I do not know for certain. We have the web statistics and reports, of course, that we can pull out any time. But in terms of the aliases, I'm not sure.

Q. What do you mean by "the aliases"?

A. Meaning in an ad you can have a back slash, and so the "Brain Matters/patients" for example. And then if someone were to go to that, you would know that they were directed there likely from that ad as opposed to randomly finding it from somewhere.

Q. Now I know you said you had web statistics you could show any time. Are you talking about visitors and physicians?

A. Yeah, visitors, physicians, referrals, et cetera.

Q. How do you tell if someone is a referral?

A. I believe, I am not a programmer, I do not analyze the statistics the way they would, but I believe you can tell where they originated from. So if they came from Google, for example, versus another website.

Q. All right. Would you say that as a general matter the Brain Matters program is addressed to educating?

MR. PRANGE: Object to the extent it mischaracterizes testimony.

Q. You can answer.

A. I'm sorry, can you repeat the question?

MS. JEFFERY: Would you read it back, please.

(Whereupon the requested portion of the record

was read aloud by the Court Reporter.)

A. I would say that it is the purpose is to provide information of which one aspect is education.

Q. What other aspects of providing information are there?

A. Awareness, advocacy. Off the top of my head, those are a couple that I am thinking of. Raise money.

Q. Do you consider it to be providing medical services?

MR. PRANGE: I will object to it as vague and the ambiguity of "medical services." If you understand it, you can answer.

THE WITNESS: Can you clarify?

Q. Do you have any common understanding of the word "medical services"?

A. Yes. So if I am understanding medical services as providing information that has to do with, you know, a medical topic, yes.

Q. And you consider providing medical information about a medical topic to be medical services?

A. Yes.

Q. Okay. I see here on Exhibit 11 that this is an issue about funding on Page AAN 00099.

A. (Reviewing.)

Q. Is this the original funding for the

organization, do you know?

A. "Organization" meaning Brain Matters or the academy?

Q. I mean AAN?

A. No.

Q. Does this funding relate to the program "Brain Matters"?

A. Yes.

Q. What is the "Brain Attack Campaign"? It is referenced on Page AAN 00104.

A. (Reviewing.) Based on this document, it looks like it was a campaign specifically targeted to address stroke under the Brain Matters. But I, again, I wasn't around during this time, so I'm not sure.

Q. Are you familiar with the work that Barksdale Ballard did?

A. Only through reviewing this document, but no.

Q. What kind of an entity is Barksdale Ballard?

A. My understanding is they were a public relations or some sort of outside consulting entity.

Q. Was it marketing or advertising?

A. I'm not sure.

Q. So you have no knowledge of this campaign except what you read in this document?

A. Correct.

MR. PRANGE: For clarification, you mean the "Brain Attack Campaign"?

MS. JEFFERY: Thank you for clarifying that.

BY MS. JEFFERY:

Q. Let's start with the "Brain Attack Campaign," to your knowledge this is the only knowledge?

A. That's right.

Q. What about the Brain Matters campaign?

A. That's not true.

Q. Is the Brain Matters the campaign or the overall focus of AAN?

A. It was not the overall focus of the academy. It was a campaign established under the Foundation to address the needs that we talked about that we addressed earlier.

Q. Okay. And those are the needs of patients and caregivers to get more information?

A. Yes.

Q. Regarding different illnesses?

A. Different neurological conditions and information about the brain obviously.

Q. I will show you Exhibit 1.

A. Sure.

Q. Can you identify Exhibit 1?

A. It appears to be the "Brain Matters" trademark.
Q. Do you have any involvement with the trademark matters in any way?
A. No.
Q. You do have responsibility for the website?
A. Yes.
Q. All right. Did you develop the website?
A. My group worked to develop a second and third iteration of the website.
Q. Do you know when the website started?
A. It was before I started at the academy. I believe it was in -- I do not know for certain when the first website was launched.
Q. When did you get involved?
A. In approximately the start of 2001.
Q. What was the process used to develop the website?
A. The process used to develop the iteration of the website that I was involved in was transferring the hosting location from an outside entity, doing a redesign, and updating the content in the first round. Second round was a much more extensive process, where we updated the design and completely re-routed the content.
Q. When was what you called the first iteration? When was that?

A. That would have been -- that would have started around 2001.

Q. What about the second iteration?

A. The second one, 2005 I believe it was completed. Actually, I think it was the end of 2004, to clarify. 2004/2005 was when we launched it.

Q. I'm sorry, that's when the website was launched?

A. I'm sorry, the third iteration of that; the redesign.

Q. Who develops the content, the substantive content of the site?

A. It is a collaborative effort between physicians that are identified based on their expertise and specialty and writers that we have on staff.

Q. Okay.

(HOFFERT Deposition Exhibit 12 marked for identification.)

BY MS. JEFFERY:

Q. Can you identify Exhibit 12?

A. Yes. It looks like the project outlined for the editorial team who worked on the sleep portion of the website.

Q. What is the sleep portion of the website?

A. The website is -- has approximately 14

different disease states, so sleep would be one of those topics.

Q. What are the others?

A. Well, we have -- from my recollection we have headache, stroke, brain injury, Alzheimer's, Parkinson's, MS, sleep would be one.

Q. ALS?

A. ALS. Yes, thank you. Off the top of my head I can't recall the other.

Q. Epilepsy?

A. Epilepsy would be one.

Q. Did you have any involvement with this editorial team on the sleep section of the program?

A. Not directly, but my team worked, for example, with -- this would have been the physician group that worked on the sleep section (indicating).

Q. Who developed the outline for what the content would be?

A. It would have been a collaborative effort between at the time the woman who was managing for the Foundation this particular project and -- and my group.

Q. Was there a training program for the physicians who were involved in this portion of the program? A writers' workshop or conference?

A. I believe they were prepped and that everybody

got similar outlines and we talked to them about how they should be writing for the web, but not a formal training that I'm aware of.

Q. What do you mean when you say you talked to them about how they should be writing for the web?

A. Meaning, for example, giving them an outline, like this, as opposed to, "What do you know about sleep?" It helps us narrow and focus it for the vehicle that we are writing for.

Q. And did you have comparable outlines for the other portions of the website?

A. I would assume so. I -- I would assume so.

Q. Is this something that you developed?

A. No.

Q. Was it developed under your direction?

A. This was -- this was -- this particular document was developed, again, by the woman who was managing the project at the time for the Foundation.

Q. "The project" being what?

A. Being the redesign of the Brain Matters website.

Q. Okay. I must have misunderstood. I thought that was you.

A. It is a little bit confusing. But what happened was the Foundation owned sort of the programatic

component of the Brain Matters until February of '06, I believe, where everything was transferred to us. So prior to that time we were, again, sort of like an outside firm to her, providing services, providing writing, design, et cetera. So we worked in partnership as internal staff, but we didn't drive necessarily the final product or the decision for the final product at that point.

Q. Who does make those decisions?

A. At that point in time it was under the Foundation. And currently it would be me, in coordination with Cathy Rydell, my boss.

(HOFFERT Deposition Exhibit 13 marked for identification.)

MR. PRANGE: Do you have another copy of that?

MS. JEFFERY: Yes, I'm sorry. Here it is.

MR. PRANGE: No problem.

BY MS. JEFFERY:

Q. Can you identify Exhibit 13?

A. It looks like an outline of a campaign. I have not seen this document before though.

Q. Are you familiar with a stroke initiative?

A. No.

Q. Is this something that was a part of the website?

A. Not to my knowledge.

Q. Do you know -- did you say you don't know about the stroke initiative?

A. No, I don't know about it.

Q. How about stroke management workshops, do you know anything about that?

A. No.

(HOFFERT Deposition Exhibit 14 marked for identification.)

BY MS. JEFFERY:

Q. Can you identify Exhibit 14?

A. It appears to be an early patient education brochure.

Q. Relating to Alzheimer's Disease?

A. Yes.

Q. What is a patient education brochure?

A. It is a pamphlet that doctors can distribute to their patients to help them understand their disease.

Q. Would you describe it as a way to educate patients about Alzheimer's Disease?

MR. PRANGE: Objection to the extent it mischaracterizes testimony. You can answer.

THE WITNESS: Yes.

Q. Did you have any involvement in preparing this brochure?

A. No.
Q. Do you know who did?
A. No. It -- but based on the address, it was very -- it looks like a very early iteration.
Q. Do you have any idea of what year that would be?
A. I do not know. But we were not in the same location.
Q. What does "The Brain Matters" mean?
A. "The Brain Matters" means that your brain matters.
Q. Your brain is important?
A. Your brain is important. Yes.
Q. Okay. Any other meaning?
A. I think it also is a spin-off of "Brain Matters," meaning the physical composure of the brain.
Q. Anything else?
A. I think -- I think that -- not that I can come up with on the spot.
Q. Do you know if Exhibit 14 was prepared internally or whether it was prepared by an outside agency?
A. I do not know.
(HOFFERT Deposition Exhibit 15 marked for identification.)
BY MS. JEFFERY:

Q. Can you identify Exhibit 15?
A. It is a patient education brochure for ALS.
Q. Did you have any involvement in preparing this?
A. No.
Q. Do you know who did?
A. No.
Q. Do you know when it was prepared?
A. Again, I think early, very early. Meaning before the academy moved to its new location. I don't know when that was.
Q. Okay.
(HOFFERT Deposition Exhibit 16 marked for identification.)
Q. You said that this was an information brochure about ALS?
A. Yes.
Q. The one that we were just looking at, 15?
A. Yes.
BY MS. JEFFERY:
Q. Can you identify Exhibit 16?
A. It is a brochure for multiple sclerosis.
Q. What was it used for?
A. It is used, doctors give this to their patients I would assume.
Q. Is that to educate their patients about

multiple sclerosis?

A. Yes.

Q. Do you know who prepared it?

A. No.

Q. Do you know when it was prepared?

A. No.

Q. Okay.

(HOFFERT Deposition Exhibit 17 marked for identification.)

BY MS. JEFFERY:

Q. Can you identify Exhibit 17?

A. It is a patient education brochure on epilepsy.

Q. Is that something that doctors give to their patients to help them understand what epilepsy is?

A. Yes.

Q. To help to educate them about epilepsy?

A. Yes.

Q. Did you prepare this?

A. No.

Q. Do you know who prepared this?

A. No.

Q. Do you know when it was prepared?

A. Not exactly.

Q. Not exactly? Do you know approximately?

A. No. Sorry.

(HOFFERT Deposition Exhibit 18 marked for identification.)

BY MS. JEFFERY:

Q. Can you identify Exhibit 18?

A. It is a patient education brochure on stroke.

Q. Was this a brochure that the doctors give to their patients to educate them about stroke?

A. Yes.

Q. Did you prepare it?

A. No.

Q. Do you know who prepared it?

A. No.

Q. Do you know when it was prepared?

A. No.

(HOFFERT Deposition Exhibit 19 marked for identification.)

BY MS. JEFFERY:

Q. Can you identify Exhibit 19?

A. It is a patient brochure for Parkinson's Disease.

Q. Is this something that doctors give to their patients to educate them about Parkinson's Disease?

A. Yes.

Q. Is this something that you prepared?

A. No.

Q. Do you know who prepared it?
A. No.
Q. Do you know when it was prepared?
A. No.
(HOFFERT Deposition Exhibit 20 marked for identification.)
BY MS. JEFFERY:
Q. Can you identify Exhibit 20?
A. It is a page from our current website.
Q. And what is the function of this page? Or I think it may be two pages?
A. This is a fact sheet, so it is just a very high level list of some of the -- some of the attributes of the organization and what a neurologist is and it also talks about the Brain Matters.
Q. What do you mean when you say it is a high level? Can you give me an explanation.
A. It means it has limited bullet points and we are a very complex and large organization, so.
Q. And who is it addressed to?
A. This would be addressed to -- well, we are looking at the press section, so the primary audience would be the press or public, who goes to the site seeking information on the organization.
Q. Your members would already have this

information, wouldn't they?

A. They would know.

Q. Who are your members?

A. Our members are over 20,000. We have over 20,000 members. A majority of them are practicing neurologists and also academic positions. And we have affiliate membership, which includes, could include nurse practitioners or other healthcare professionals, practice managers.

Q. Do you know how many neurologists there are in the country?

A. In the country? I am not certain. I -- we have a very high percentage of membership, almost 98 percent of the neurologists belong to the academy or something to that effect. So it is around, you know, 15,000 or more.

I mean 20,000 includes all of our members, which could include the affiliate membership category.

Q. Did you prepare Exhibit 20?

A. Me, personally, no. My group though.

Q. Was it under your direction?

A. Yes.

Q. Tell me the process that you go through to create something like this.

A. Well, we -- we essentially assign a writer, and if we need it, we identify a subject matter expert, and the

writer and subject matter expert and potentially another person, someone who owns the program within the organization would work together to develop the content. And then we have editors who review it.

Q. What do you mean "someone that owns" the project?

A. Meaning a project owner. Someone whose primary job, and in this instance the media relations manager would be the person responsible for the programatic piece of this, works with the writer, and may or may not work with the physician.

Q. What happens to it after it is prepared?

A. After it is prepared?

Q. Yes. Once Exhibit 20, the text is prepared, what happens?

A. Do you mean how does it get on the website?

Q. Yes. Where does it go after it goes out of your office? Or does it stay in your office? Once it is written what happens?

A. Once it is written it is posted to the website.

Q. Okay. Do you have a board of physicians who review the materials before they post it?

A. No. Currently we do not have a designated body that would review this. However, if there is something that has information that warrants a physician review, which a

lot of the information on our website does, it would be done with the appropriate person.

Q. And the purpose of this portion of the website is to educate people about AAN?

A. This portion of the website is to give the media a quick fact sheet about the AAN.

(HOFFERT Deposition Exhibit 21 marked for identification.)

BY MS. JEFFERY:

(Off the record.)

MS. JEFFERY: Let's mark these.

(HOFFERT Deposition Exhibits 22 through 38 marked for identification.)

BY MS. JEFFERY:

Q. Going back to 21. Can you identify Exhibit 21?

A. It is a page from our website.

Q. What is the purpose of this page?

A. It is an overview of several -- several offerings we have that are categorized under the public education heading.

Q. So the bullet points refer to individual efforts for public education; is that right?

A. Yes.

Q. Can you identify Exhibit 22?

A. It is another page from our website and the academy section.

Q. What is the purpose of this section?

A. This is to list our mission and the executive staff roster.

Q. Looking at the mission statement, where it says one of the missions is to ensuring appropriate access for neurological care?

A. Uh-huh.

Q. Could you answer yes or no, please?

A. Yes. Sorry.

Q. Do you consider that portion of your mission statement to be providing medical services?

MR. PRANGE: Object to the form on ambiguity of medical services.

Q. Do you have an understanding of what the term "medical services" is?

A. I do.

Q. What is it?

A. It is to provide medical care to people.

Q. Okay. Using that definition, do you consider that ensuring appropriate access to neurological care are medical services?

A. It is -- can I hear the question again? There was no question.

MS. JEFFERY: Would you read it back, please.

(Whereupon the requested portion of the record was read aloud by the Court Reporter.)

A. Yes.

Q. What about supporting and advocating for an environment that ensures ethical, high quality neurological care, do you consider that to be providing medical services?

MR. PRANGE: Object based on ambiguity.

Q. I am going to be using your definition of medical services for this series of questions.

A. Of providing medical care?

Q. Correct.

MR. PRANGE: That's fine.

THE WITNESS: For some reason I'm having a problem with the question.

Q. Okay. I'm looking at the mission statement and I'm now looking at the second bullet point.

A. Yes.

Q. And it says, "Supporting and advocating for an environment that ensures ethical, high quality neurological care." I want to know if that mission constitutes providing medical services?

A. It is. The mission is to support our neurologists in providing medical services.

Q. So it is not itself providing them, it is to support others in providing them?

A. The academy does not treat patients, our members do.

Q. "Providing excellence and professional education by offering a variety of programs in both the clinical aspects of neurology and the basic neuroscience to physicians and allied health professionals," do you consider that mission to be providing medical services?

A. Not the academy directly, no.

Q. And the last one, "supporting clinical and basic research in the neurosciences and related fields," do you consider that to be providing medical services?

A. Not the academy, no.

Q. The academy itself doesn't provide any medical services, does it?

A. Right. Correct.

Q. Okay.

MS. JEFFERY: Did we get the copies of these?

MR. PRANGE: They are still coming.

MS. JEFFERY: No problem. I will just have to remember.

(HOFFERT Deposition Exhibit 39 marked for identification.)

BY MS. JEFFERY:

Q. What is the URL for the website?

A. Thebrainmatters.org

Q. Do you know how that name was created?

A. How it was created in as who came up with it?

Q. Yes. That is one portion of it. Just how it was chosen?

A. I do not know specifically how that particular name was chosen.

Q. Do you know generally how that name was chosen?

A. Generally I believe working with an outside entity or consulting or PR agency of some sort it was chosen.

Q. Was it an original purchase or was it purchased from a third-party?

A. I do not know.

Q. Okay. Can you identify Exhibit 39?

A. These are copies of ads for thebrainmatters.org

Q. Did you develop these ads?

A. I did not personally develop them. My team developed them.

Q. They were developed under your direction and control?

A. Yes.

Q. Where are these ads placed?

A. These are placed in our publications. Yes, in our publications.

Q. Can you tell me what publications?

A. AAN News, Neurology Today, Neurology Now, Neurology.

Q. Any others?

A. We have had at least one placement in -- I don't remember the name of the publication off the top of my head, but it was -- it was not one of our publications. It -- I'm trying to think of the name of it. It is not coming to me at this time.

Q. Okay. Is there other advertising that you are aware of, let's say, during your tenure?

A. Can you define what you mean by "advertising"?

Q. I'm sorry?

A. Define what you mean by "advertising."

Q. For this particular question I am talking about advertisements of the same type as Exhibit 39.

A. Specifically an ad for the website, no.

Q. You are not aware of any others?

A. Well, not -- not other ads for the website.

Q. I didn't mean to interrupt you.

A. No.

Q. You advertise for other portions of the AAN?

A. Yes, and we also promote the website through

Q. Were you involved in the preparation of Exhibit 23?

A. No.

Q. Was it prepared under your direction or control?

A. No.

Q. Do you know who prepared it?

A. I do not.

Q. Do you know when it was prepared?

A. I do not.

Q. Do you know if it is currently used?

A. It is currently used, distributed.

Q. Do you know the magnitude of the distribution?

A. We take materials like this often times to state society meetings, for example. I don't know the magnitude, but we distribute it when there is an opportunity to reach that particular audience.

Q. You don't know what the size is though?

A. I do not know the size, no.

Q. Okay. Can you identify Exhibit 24?

A. It is a brochure entitled, "What is a neurologist?"

Q. And what is the function of this brochure?

A. This is to explain to anyone who doesn't know what a neurologist is what a neurologist is and does.

Q. To educate people who don't know what a neurologist is?

A. Yes.

Q. Did you have anything to do with the preparation of this document?

A. No.

Q. Do you know when it was prepared?

A. I do not.

Q. Is it currently in use?

A. Yes.

Q. Do you know the volume of distribution?

A. I do not know the volume of distribution.

Q. Do you know what Exhibit 25 is?

A. This is one of our current patient brochures for stroke.

Q. What is this brochure used for?

A. This is sold through our store. It is used to explain stroke to people who needed it explained to them.

Q. Do you know what the volume of distribution of this document is, Exhibit 25?

A. Not specifically, no.

Q. Do you know generally?

A. I know that we can get that information through our sales tracking.

Q. I think you mentioned that you set up stores at

conferences; is that right?

A. We set up a store at the annual meeting. So it is one store once a year.

Q. And is it the annual meeting of AAN or the annual meeting of the Neurologists Society?

A. It is the annual meeting of the academy.

Q. Who comes to that?

A. We -- neurologists, including international attendees and exhibitors and the media.

Q. Do lay people come?

A. Not to my knowledge. At least that's not the bulk of the audience.

Q. So would you say then that Exhibit 25 is sold to physicians for distribution to patients?

A. Yes.

Q. Did you have anything to do with the preparation of Exhibit 25?

A. Yes.

Q. What was your role?

A. It was done in my group.

Q. May I see those two, please?

A. These?

Q. No. Those. Thank you.

A. (Handing.)

Q. Thank you. So this was prepared apparently in

2005; is that right?

A. It looks like the copyright is 2004.

Q. Really? On Exhibit -- which one are you on?

A. (Indicating.)

Q. Oh, I am on a different one. Yes. We are on 25, right?

A. 25.

Q. Yes. I had the wrong one. Okay. This was prepared in 2004. You say that it was prepared under your direction?

A. Yes.

Q. What process is used to develop this? What process was used to develop this?

A. You mean in terms of the writing, design, or which portion, or everything?

Q. Yes. Let's start with the writing, and we will go to the design.

A. The writing is done by drafting content, identifying a physician who is an expert or a panel of physicians who are experts in a specific disease state. It goes through several iterations of review. And then once it is approved, the content is done.

Q. And what about the design?

A. The design in this situation we used an illustrator to illustrate the pictures that are in the

brochure and then the layout was done by -- by a designer in our group.

Q. You mentioned something about a panel of physicians. What is that?

A. All I mean by "panel" is in certain situations it may be more than one physician that is identified to look at the brochure.

Q. Do you have a group of physicians that you turn to?

A. Primarily in a situation like this we would turn, and I believe in this specific situation we worked with the practice committee to help us identify the best person.

Q. What is the practice committee?

A. The practice committee is a committee that focuses on practice issues.

Q. And what do you mean by "practice issues"? Are you talking about medical or business, or both?

A. Both.

Q. Can you identify Exhibit Number 26?

A. This is a brochure called "Understanding sleep disorders."

Q. Is it produced so that people can be educated about sleep disorders?

A. Yes.

Q. How is it distributed?
A. It is sold through our store and it is also -- we also distribute it if someone calls in and asks for it, actually in to member services.
Q. Did you prepare the document?
A. I did not, but it was done under my direction in my group.
Q. Was the procedure used the same as you described for me for Exhibit 25?
A. Yes.
Q. Can you identify Exhibit 27 for me?
A. It is a brochure called "Understanding epilepsy."
Q. And this is prepared for and distributed to people who need to be educated about what epilepsy is?
A. Yes. Or have been recently diagnosed, yes.
Q. Was this prepared in the same manner in which you described for Exhibit 24?
A. Yes.
Q. And is it distributed the same way as you described in Exhibit 24?
A. Yes.
MR. PRANGE: Do you mean in Exhibit 25?
Q. Well, I think 24 was the one that she gave me the specific details on. No, you are right. You are right.

25?

MR. PRANGE: I think it started on this one, 25.

MS. JEFFERY: You are right.

BY MS JEFFERY:

Q. Can you identify Exhibit 28?

A. This is a brochure called "Understanding migraine headache."

Q. What is the purpose of this brochure?

A. It is to -- it is for doctors, primarily for doctors to give to people who are seeking information about migraine headache.

Q. How is it prepared?

A. It is -- we draft the copy and have it reviewed by a specific physician who has been identified as a specialist on migraines, it is then approved and then ready for production.

Q. Can you identify Exhibit 29?

A. This is a brochure called "Understanding multiple sclerosis."

Q. Is it prepared for and distributed to people who are looking for information or education regarding multiple sclerosis?

A. Yes. And it is also, of course, prepared for our doctors to distribute to those people as well.

Q. All right. And was this prepared in the same way as Exhibit 28?
A. Yes.
Q. Also under your direction?
A. Yes.
Q. Can you identify Exhibit 30?
A. This is a brochure called "Understanding brain injury."
Q. What is the purpose of this document?
A. The purpose is to give information to people seeking an understanding of a brain injury or people who have brain injury. And it is also a vehicle for our doctors to provide that information.
Q. Were you involved in the preparation of Exhibit 30?
A. It was done under my direction by my group.
Q. And was it done in the same manner as you described for Exhibit 29?
A. Yes.
Q. Can you identify Exhibit 31?
A. This is an AAN summary of evidence based guidelines for clinicians.
Q. May I see the document that you are looking at?
A. (Indicating.)
Q. They are not the same? What is this document

used for?

A. This document is used to give neurologists and other doctors a quick reference to our guidelines, which are extensive documents.

Q. Are those guidelines prepared by the -- did you say the practice management group?

A. The guidelines are prepared by special -- actually, special work groups that are set up to review literature and write and -- essentially review the literature, write it, and then prepare guidelines. It is a two-year process.

Q. Are those people employees of AAN?

A. There are employees who help the process, but they are physicians who are actually doing the work and preparing the guideline.

Q. Once the physician group prepares the guidelines what happens?

A. Once the guideline is prepared, it is published in our Journal of Neurology and then it is distributed to neurologists and other healthcare professionals.

Q. Were you involved in the preparation of Exhibit 31?

A. My group was involved in laying out the information and editing the information.

Q. But you don't have any role in choosing who

will write the technical information; is that right?

A. Correct.

Q. Can you identify Exhibit 32?

A. This is an AAN guideline summary for patients and their families.

Q. So this is intended then as education for patients rather than information and guidelines for physicians; is that right?

A. Yes.

Q. Is this prepared in the same way as you described for the guidelines for the physicians?

A. This is a synthesis of that information for patients.

Q. And the synthesis is also prepared by physicians?

A. Yes.

Q. Okay. Could you identify Exhibit 33?

A. It is an AAN summary of evidence based guideline for clinicians on a different topic I guess.

Q. On Parkinson's Disease?

A. Yes.

Q. Is this one of the group of guidelines that you described as being prepared by physicians in a two-year process?

A. Yes.

Q. And is this then prepared and distributed in the same way as Exhibit 32?

A. Yes.

Q. Could you identify Exhibit 34?

A. This is an AAN guideline for summary to the patients and their families, again, on Parkinson's Disease.

Q. All right. Is this Exhibit 34 the same type of synthesis of the information in Exhibit 33 that you described before?

A. It would be more in 32.

Q. Yes. All right. You had two clinicians to the patients and their families; is that right?

A. Correct.

Q. To the patients and their families are those syntheses the comparable ones as to the physicians?

A. Correct.

Q. Can you identify Exhibit 35?

A. This is a summary of evidence based guideline for clinicians. Again, on another topic.

Q. And that is for depression, dementia and psychosis in connection with Parkinson's Disease?

A. Yes.

Q. And this is the one for the patients and their families?

A. This is the one for clinicians.

Q. May I see the one you have?
A. (Indicating.)
Q. We just did 36; is that right?
A. 35.
MR. PRANGE: 35 I have is AAN 000478.
Q. Okay. This is AAN 000480. And it is Exhibit 36.
MR. PRANGE: Okay.
BY MS. JEFFERY:
Q. Can you tell me what Exhibit 36 is?
A. It is an academy guideline summary for patients and their families, again, on related issues of Parkinson's Disease.
Q. Depression, dementia and psychosis?
A. Correct.
Q. And this is prepared to educate the patients and their families about that issue; is that right?
A. It is prepared to synthesize the research and the guideline.
Q. For the patients and their families?
A. Correct.
Q. So that they can learn what they need to know or want to know about depression, dementia and psychosis?
A. Right. As mentioned in the guideline.
Q. All right. Can you identify Exhibit 37?

A. This is an "Academy summary of evidence based guideline for clinicians who are on status epilepticus in children."

Q. Is this prepared in the same way as other guidelines for physicians that we have discussed?

A. Yes.

Q. And then Exhibit 38, is that the related?

A. It is a duplicate. Sorry.

Q. Is that the related guideline summary for the patients and their families relating to static epilepticus with families and their children?

A. Yes.

Q. So the process seems to be one is done and it is more detailed and it takes several years, that is done by physicians (phonetic), and then there is a later one, a simultaneous one that is done on the same subjects that is addressed to an audience of patients and their families?

MR. PRANGE: Objection; assumes facts not in evidence.

THE WITNESS: The guideline is separate. Both of these are summaries of the guideline, but everything else you said is correct.

Q. Okay. So the summary of guidelines for clinicians is just a breakdown of a more detailed document?

A. Exactly.

Q. Is the more detailed document the one that is published in your Neurology?

A. The Neurology; the journal.

Q. This is kind of a synthesis of what is in the journal?

A. Yes.

Q. And then the one for the patients and their families is a further synthesis to make it more in lay terms?

A. For the patients and their families.

Q. For the patients and their families, so that they can learn about whatever the illness is?

A. Yes, the guidelines.

Q. The guidelines, okay.

(HOFFERT Deposition Exhibit 40 marked for identification.)

BY MS. JEFFERY:

Q. Can you identify Exhibit 40?

A. This is an insert that was done for USA Today under the Brain Matters. Yeah.

Q. So this is an advertising summary, a supplement rather, to USA Today that was prepared in November of 2000 or was published in November of 2000?

A. Correct.

Q. So was that before your tenure?

a deposition exhibit that is confidential. We will just designate at least this portion of the testimony under the protective order when we are talking about the documents.

MS. JEFFERY: This document?

MR. PRANGE: Yes, and the testimony surrounding it.

MS. JEFFERY: Right.

MR. PRANGE: Versus -- I mean -- off the record.

(Off the record.)

(Whereupon, Exhibit 41 is deemed "Confidential" and this portion of the testimony regarding Exhibit 41 is "Confidential.")

REDACTED

REDACTED

REDACTED

REDACTED

REDACTED

REDACTED

(Whereupon, the "Confidential" portion of the testimony ends.)

(HOFFERT Deposition Exhibit 42 marked for identification.)

BY MS. JEFFERY:

Q. Could you tell me what Exhibit 42 is?

A. It is an Urchin report on the Brain Matters.

Q. What is an Urchin report?

A. It is the software that we use to track statistics, web statistics.

Q. What web statistics does it track?

A. Well, it tracks visits, hits, referrals, et cetera. This report looks like it is reporting on total hits on the last page.

Q. What is the difference between a session and a hit?

A. Well, I am not an expert, but my understanding is that a session would be a unique visitor to the website. And a hit would be the number of times an image or something is downloaded when someone is on the site.

Q. That is different than total bites transferred?

A. I do not know what total bites transferred is.

Q. And total pages viewed?

A. I'm sorry, I am not seeing where you are looking.

Q. Sorry. On the '04 -- '06 summary on the last page.

A. Yes.

Q. The third -- second thing down is page views,

oh, the third one is hits, and the next one is -- you had told me about downloading pages. And which one was that?

A. That -- that I was referring to hits as being images and other items that are downloaded when you hit a page.

Q. Okay. What is a bites transferred?

A. I do not know.

Q. Page view?

A. I am not exactly sure how you would distinguish page view to tell you the truth.

Q. What is this page used for?

A. To track sessions and page views.

Q. And the purpose for that is what?

A. To monitor traffic to our website.

Q. Why do you want to do that?

A. To have an understanding of whether or not people are coming to our site.

Q. Do you get enough information to know whether to make changes to the site?

A. Yes. This is a valuable report. It could determine changes, but to date we haven't used it in that way.

Q. Okay. Can you tell from this report how many hits relate to a particular type of an audience?

A. Not from the report that I'm looking at.

Q. Do you have a separate report that does that?

A. Actually, no. We cannot necessarily specify audience I believe. Again, I am not an expert, but I think we can get referrals where they have come from, but not necessarily who they are.

Q. And referrals is what you told me before, whether it came from another website or a group?

A. Yes. Correct.

Q. Okay.

(HOFFERT Deposition Exhibit 43 marked for identification.)

BY MS. JEFFERY:

Q. Can you identify Exhibit 43?

A. If I could just have one moment?

Q. Sure. I'm sorry.

A. (Reviewing.)

MR. PRANGE: Again, we should probably mark this section of the testimony as confidential if we are going to go document by document, and just identify that topic.

MS. JEFFERY: Fine. I have no objection.

(Whereupon, Exhibit 43 is deemed "Confidential" and this portion of the testimony regarding Exhibit 43 is "Confidential.")

THE WITNESS: This appears to be a focus

group transcript.

Q. Are you familiar with the focus group that this relates to?

A. I believe I -- I know -- I wasn't specifically involved, but I know of the focus groups that were conducted, yes.

Q. How many are you aware of?

A. I just know that it happened. I don't know the number of participants or the number of sessions or anything like that.

Q. Do you know what the subject matter was of the various focus groups?

A. The subject matter would be what is included in the script.

Q. In Exhibit 43?

A. In Exhibit 43.

Q. So the only -- Exhibit 43 substantively would be the only type of focus groups that you are aware of?

A. Yes. And to clarify, this is a focus group that was done with the public. So your question is is it the only focus group I'm aware of?

Q. Of that type?

A. We have done public focus groups before. This is a specific one, though, that was done I think to gauge the understanding of how much the public -- I'm sorry, how

much the public understands neurology and neurological disease.

Q. What other types of focus groups are you aware of having been conducted?

A. Well, we do lots of focus groups. We have an entire department that does focus groups at the organization.

Q. Is that under you?

A. No.

Q. What group does that relate to?

A. That is under our operations department. And I don't believe they actually did this focus group. I think it was done by an outside entity.

Q. Are you aware of surveys that were done relating to peoples' awareness of different types of medical specialties and different illnesses?

A. No. I am not.

Q. Now I believe that you said that you are aware of various focus groups, but that you don't know the details of them; is that right?

A. I am aware that a focus group is done with the public based on this script. I wasn't involved and I don't know the details of how many people.

Q. Okay.

(HOFFERT Deposition Exhibit 44 marked for

identification.)

MS. JEFFERY: This document is also confidential, so we should treat it the same way.

(Whereupon, Exhibit 44 is deemed "Confidential" and this portion of the testimony regarding Exhibit 44 is "Confidential.")

Q. Can you identify Exhibit 44?

A. It is a financial spreadsheet.

Q. For the time period October 1996 to August '06?

A. Yes.

Q. Do you know if this represents a specific portion of the financial statement?

A. I believe this represents the monies that were allocated to public activities, including the Brain Matters.

Q. Can you tell from this document how much the advertising and marketing expense was that specifically related to the website?

A. That is specifically related to do?

Q. No.

Can you tell from Exhibit 44 what the advertising and marketing expense is for the trademark the Brain Matters?

A. Do you mean -- can you clarify the question? Do you mean registration of it?

Q. I mean advertising and promoting it?

A. Well, from my understanding this is a complete statement of the expenditure related to both the promotion and the development of the website and related educational efforts.

Q. So would this be the expense, all of the expenses for AAN and the related entities; Exhibit 44?

A. No. This is just a slice of the public portion. Meaning the stuff that we have been talking about, and specifically the Brain Matters and all of the activities that go into that public campaign.

Q. Including the website?

A. Including the website.

Q. Okay. And I believe you said that you could not tell how much relates specifically to the website?

A. In terms of development potentially, but your question was advertising, correct?

Q. Well, that is my first question. Advertising and marketing of the website?

A. Well, how we understand it is that all of our efforts where we are putting out the website URL, for example, is advertising and marketing of it. And so all of these costs essentially, the nucleus of it is the website and the Brain Matters.

Q. Okay. Is there any allocation between the cost of your public education campaign and the apparently smaller

portion that would be attributable to the website?

A. I'm sorry, can I hear the question again?

(Whereupon the requested portion of the record was read aloud by the Court Reporter.)

MR. PRANGE: Objection; ambiguous. What do you mean by "attributable to the website"?

Q. Do you know what the word "attributable" means?

MR. PRANGE: But --

MS. JEFFERY: I am asking her.

THE WITNESS: You mean in terms of development of the website?

BY MS. JEFFERY:

Q. In any way related to?

A. Yes. There are dollars on here that can be attributable to the website. But not necessarily -- I can't really know -- I can't slice it up and know exactly the dollar amounts. These are general categories.

Q. Relating to all activities of AAN?

A. No.

Q. Okay. They are related to what?

A. They are related to the public education efforts under the Foundation.

Q. Okay. So the public education efforts under the Foundation you are including in that the web side?

A. Yes.

Q. But you can't tell me, at least not based on this document, which portion relates to the website as opposed to the rest of the public education campaign?

A. Correct.

Q. Okay. Do you have some other source to determine that from?

A. I do not. I would assume our CFO would be able to.

Q. Now, AAN doesn't provide any brain imaging scans, do they?

A. No.

Q. And they don't offer any SPECT imaging scans?

A. No.

MS. JEFFERY: Off the record.

(Off the record.)

(Whereupon, the "confidential" portion of the testimony ends.)

BY MS. JEFFERY:

Q. Are you involved in the day-to-day activities to prevent, to police and prevent unauthorized use of your website?

A. No.

Q. Is there anybody who is involved with that?

A. I would rely on our general counsel or --

Q. Mr. Sagsveen?

A. Yes. Or of course if anyone comes across activities that would be suspicious, we would forward it to general counsel.

Q. Are you aware of any activities that are what you would deem suspicious?

A. In terms of the --

Q. Website? I mean you just told me if you would come across something suspicious, you would forward it to your counsel?

A. Uh-huh.

Q. I'm wondering what you are referring to when you say that?

A. Meaning newsletters and publications in the past that had used the Brain Matters, we would send it to general counsel.

Q. Are you aware of any of those?

A. There was a newsletter in the past, but I don't recall what it was.

Q. Okay. When you say there was a newsletter in the past, are you talking about a website that was using a name similar to yours or somebody who was using a name in another context?

A. It was a -- some sort of publication that had an iteration of the Brain Matters as its title. Yes.

Q. Not a website?

A. Not a website.

Q. Do you monitor whether anyone is using a URL that is what you would consider to be infringing on your name, "thebrainmatters.org"?

A. I do not. No.

Q. Okay.

MS. JEFFERY: Let me just take a second and look at this.

BY MS. JEFFERY:

Q. We talked about market research or surveys done about public awareness of neurology as a profession.

A. Uh-huh.

Q. Are you aware of any market research surveys that were done about the awareness of the website?

A. No.

MS. JEFFERY: I have nothing else.

MR. PRANGE: Okay. I have a few questions.

EXAMINATION

BY MR. PRANGE:

Q. Melanie, I want to return to an earlier portion of your testimony regarding advertising and marketing.

Is there any distinction in your mind about advertising versus marketing?

A. I am defining advertising as potentially taking specific advertisements out in different publications. Whereas marketing I think of as more broadly the promotion using several different vehicles and means to get the word out.

Q. How has the American Academy of Neurology advertised the Brain Matters mark or website?

A. Advertised versus marketed?

Q. Advertised? I will use it in your definition.

A. Okay. Advertised, we put several different ads in our various publications and to try to get -- to build awareness.

Q. Is Exhibit 39 one of those advertisements?

A. Yes.

Q. How does the American Academy of Neurology market using your definition of the Brain Matters' website or Brain Matters mark?

A. We take every opportunity that we can to include the URL in different articles. Or like I was saying earlier, call out boxes included on our patient education brochures as the primary URL we would like people to visit. We also have it on our website, on our academy website, so that when people come to the website, they are lead to the Brain Matters, if they are seeking that type of information.

MR. PRANGE: I want to strike that.

Q. The different types of then marketing that you do in putting on different things, have we seen in exhibits examples of what you have done? Exhibits that you have been shown today?

A. There have been exhibits that reference it, yes.

Q. In looking at the exhibits that we have so far, can you identify the exhibits as exemplars of what you have already done in terms of promoting it?

A. Yes.

Q. Which exhibits are those?

A. 27 would be an example. So all of our patient education brochures where we made a concerted effort to pull out and draw attention to thebrainmatters.org as the main website that you should visit. And also the guideline and summaries for the patients and clinicians.

Q. Going back to some earlier exhibits. I want to talk briefly about Exhibit 44. Why don't you pull out your copy of 44.

MS. JEFFERY: You have to wait a minute until I find my copy.

MR. PRANGE: No problem.

MS. JEFFERY: Okay. I am ready.

(Whereupon, Exhibit 44 is deemed "Confidential" and this portion of the testimony regarding Exhibit 44 is

"Confidential.")

BY MR. PRANGE:

Q. This spreadsheet of what you have testified are expenses?

A. Yes.

Q. Well, they are monetary amounts. The public education campaign -- or strike that.

Do these expenses pertain specifically to the academy or some subpart of it?

A. They would pertain specifically to the Foundation, actually, and they would be expenses related to their public education and awareness efforts.

Q. Which public education efforts? Is there more than one public education effort or just one?

A. In theory, the goal is all the same. The Brain Matters has been the main education campaign throughout all of our efforts. However, the "Think Neurology Now Expo" is another example of a campaign that we launched which still included the Brain Matters' website as the main website.

Q. This document here in these expenditures, are these -- I believe you testified earlier, and please correct me if I am wrong, that this includes the Brain Matters campaign, it also includes some other campaign?

MS. JEFFERY: Object to the form of the question.

MR. PRANGE: I will rephrase it.

BY MR. PRANGE:

Q. Which public education campaigns does this document include?

A. The Brain Matters, The Neurology Expo and Think Neurology Now.

Q. Are those the only campaigns?

A. Yes. The --

Q. Go ahead. Were you done with your answer?

A. Yes.

Q. Okay. Can you please tell me the other two, the Brain Matters, the Think Neurology Now and?

A. The Neurology Expo.

Q. The Neurology Expo. Thank you.

MS. JEFFERY: Can you read that last question back, please.

(Whereupon the requested portion of the record was read aloud by the Court Reporter.)

BY MR. PRANGE:

Q. So the record is clear, there are the public education campaigns that are in this document are which ones?

A. The efforts done under the "Brain Matters," and also "Think Neurology Now" and "Neurology Expo."

Q. Okay. Was the Brain Matters' promotion, was

that promoted during either of the other expos? The other public education campaigns?

A. Yes. We included -- well, we distributed materials, like the patient education brochures, for example, at those events. And we included the URL on marketing pieces that were done for those. The Brain Matters URL for marketing pieces that were done for those campaigns, it was the main information repository for people to go to after attending or while attending the campaigns.

(Whereupon, the "confidential" portion of the testimony ends.)

MR. PRANGE: I have got nothing further.

MS. JEFFERY: I have nothing.

(Whereupon, at 3:30 p.m., January 18, 2007, the foregoing proceeding was terminated.)

(UPON COMPLETION, forward this original Reading and Signing Certificate to Attorney Carole K. Jeffery, who already has the Sealed Original.)

MELANIE HOFFERT

I, MELANIE HOFFERT, do hereby certify that I have read the foregoing transcript of my Deposition and believe the same to be true and correct (or, except as follows, noting the page and the line number of the change or addition desired and the reason why):

Page	Line	Change or Addition	Reason

_____

Dated this _____ day of _____, 2007.

AMH

daeb0b8a-3236-40f3-8e86-63c91488b0d3

STATE OF MINNESOTA) SS:
COUNTY OF WASHINGTON) SS:

Be it known that I took the Deposition of MELANIE HOFFERT on the 18th day of January, 2007, at the Law Firm of Oppenheimer, Wolff & Donnelly, Plaza VII, Suite 3300, 45 S. Seventh Street, Minneapolis, Minnesota;

That I was then and there a Notary Public in and for the County of Washington, State of Minnesota, and that by virtue thereof, I was duly authorized to administer an oath;

That the witness before testifying was by me first duly sworn to testify the whole truth and nothing but the truth relative to said cause;

That the testimony of said witness was recorded in Stenotype by myself and transcribed into typewriting under my direction, and that the deposition is a true record of the testimony given by the witness to the best of my ability;

That I am not related to any of the parties hereto nor interested in the outcome of the action;

That the cost of the original transcript has been charged to the party noticing the deposition unless otherwise agreed upon by Counsel, and that copies have been made available to all parties at the same cost, unless otherwise agreed upon by Counsel;

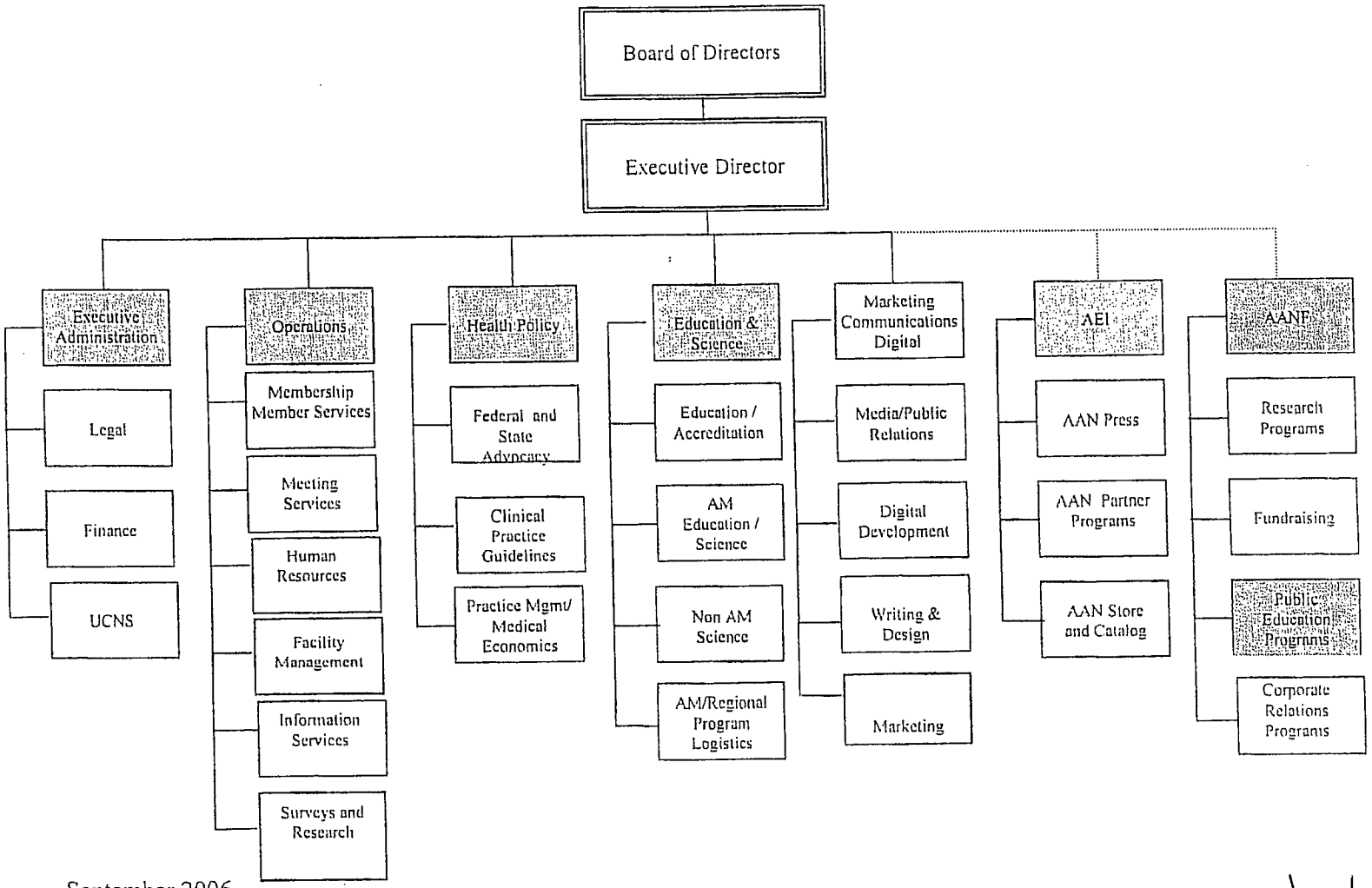
That the reading and signing of the deposition by the witness was executed as evidenced by the preceding page;

WITNESS MY HAND AND SEAL this 2nd day of February, 2007.

Ann Marie Holland

Ann M. Holland
Court Reporter

AAN Organizational Structure



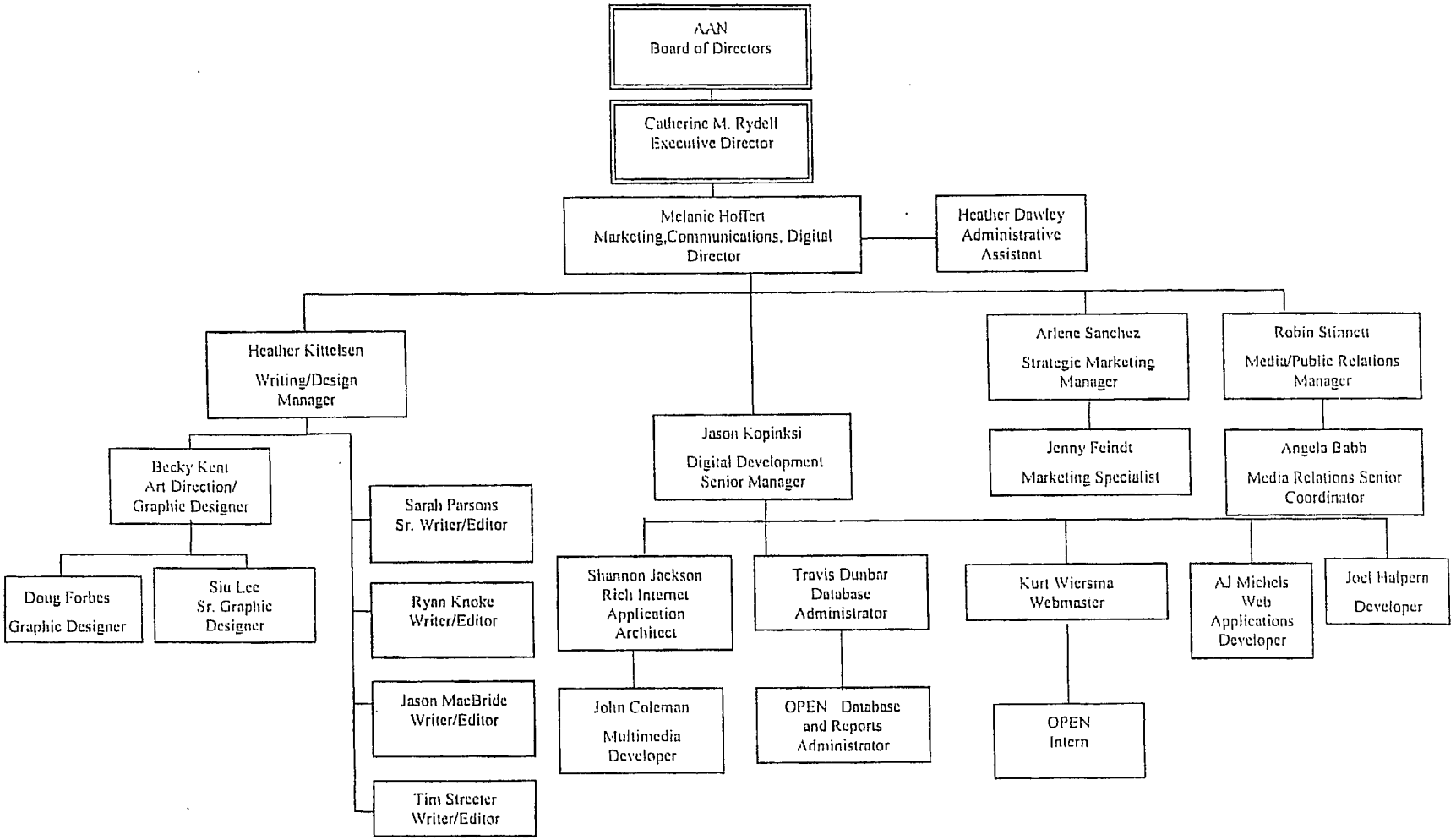
September 2006

Hoffert DATE 1/18/07

(10)

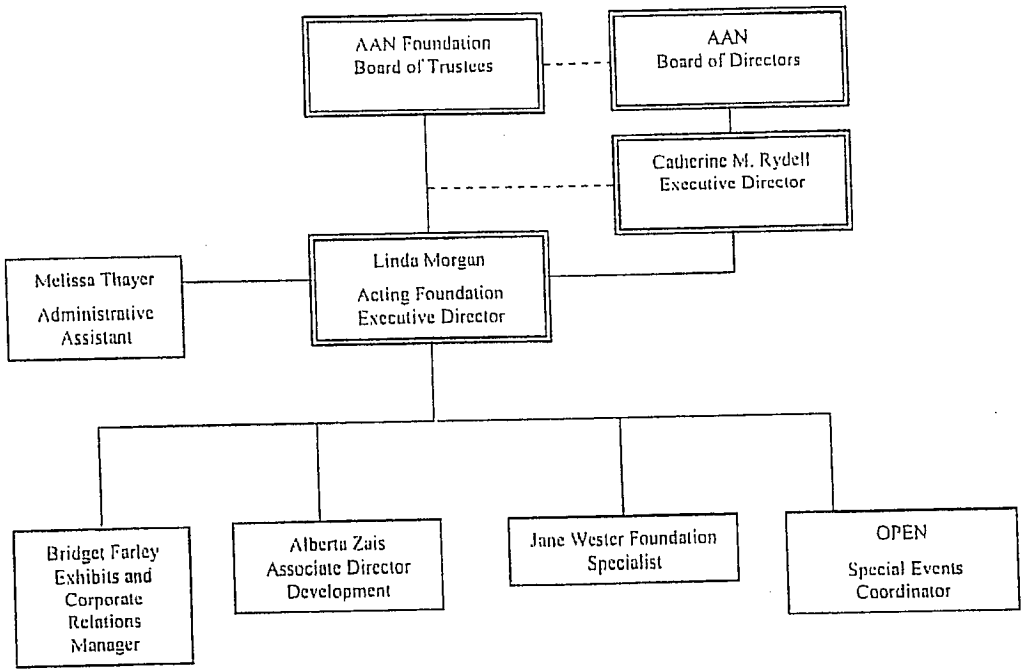
ANN M. HOLLAND

American Academy of Neurology
MCD Organizational Chart



September 2006

American Academy of Neurology
Foundation Organizational Chart



September 2006

Attachment 3

Brain Matters

Focusing Public Attention on the Importance of Neurology

AAN 00095

Hoffert DATE 1/18/07

EXHIBIT

ANN M. HOLLAND

History

Process Began in 1994

- Public & Professional Information Committee (PPIC) Proposal Submitted to Executive Committee
- Brain Attack Campaign Initiated

PPIC and Education and Research Foundation (ERF) Committees Established Public Relations as Highest Priority

- Corporate Roundtable Endorsed
- Seattle: Foundation/CRT Joined PPIC/AAN Leadership in Charting Priorities for Public Education and Outcomes Research

Strategic Planning Session at AAN: July 17

- General Agreement on Need for Major National Umbrella Public Relations Campaign to Increase Public Awareness of the value of Neurology

Request for Proposals

- Developed by AAN Staff in its Search for PR Firm to Facilitate Campaign
- Reviewed with both PPIC and ERF Leadership and Sent to Candidate PR Firms

Selected Barksdale Ballard & Co., a mid-sized PR Firm

- Experience with AGA, ASRM
- Knowledge and Understanding of AAN via CRT (TEVA Representative)
- Size/Cost Effectiveness (Big Agency Results W/O $$$)
- Fundraising Experience and Capabilities
- Commitment to the Campaign

Brain Matters

The Barksdale Ballard Plan

- A Comprehensive 3- to 5-Year Umbrella Campaign Under Which Many Individual Campaigns to Educate Specific Audiences can be executed:
  - The Brain and its Functions
  - Scientific and Medical Advances
  - How to Recognize Diseases and Disorders Affecting the Brain
  - Steps One Can Take To Keep the Brain Healthy
  - Importance of Research

- Will Position Neurologists (AAN) as Leading Advocates for:
  - Brain Research
  - Champions of Best Quality of Clinical Care
  - Cost Savings for Patients
  - Guardians of the Health And Safety of the Brain

Brain Matters

Funding:

- $50,000 of AAN Funding Will Support Writers Conference, Brain Attack Project and Concussion and Sports Paper
- Also Will Provide Development Funds for Brain Matters Campaign which will be Submitted to the AAN's Education and Research Foundation for Approval and support
  - Develop Theme, Logo, Overall Strategic Plan
  - Writing Case Statement for Support
  - Case Statement Will Be Taken to CRT and Other ERF Targets
  - Early Feedback Is CRT Will Support with $$$ & in-Kind Services
- Barksdale Ballard Has Specific Experience Raising Corporate Money and Selling Sponsorships

Brain Matters

Campaign Goal: To Help Ensure a Viable Role for the Specialty of Neurology into the Next Century

- Improve Public Health Through Increased Public Understanding of Diseases & Disorders of the Brain
- Maintain Best Quality of Clinical Care by Reinforcing Role of Neurologists within PCP-Driven System
- Augment Efforts to Increase NIH Funding & Secure Coverage of Neurological Disease Treatments
- Reinforce the AAN's Value to Current/Potential Members & Entire Health/Medical Community
- Enhance Image of Neurology by Emphasizing Contributions to Medical Science & Clinical Care
- Create Compelling Case for the AAN & Foundation

Brain Matters

Audiences:

- Patient Groups, Families/General Public
- PCPs, Allied Health Care Professionals, Other Specialists
- HMO/Managed Care Administrators, Insurers, 3rd Party Payers
- Public Policy Makers: Congress and Administration
- Neurologists/AAN Membership

In Addition to Being a Public Education and Patient Empowerment Campaign, *Brain Matters* Is a Call to Action for All Neurologists

- A Bold Step Forward & Outward Behind Which the AAN Membership Can Proudly Rally
- Must Be Convincingly Launched at Annual Conference
- Must Prepare Neurologists for More Visible and Relevant Role

Brain Matters

Campaign Strategies:

- Educate Consumers and Empower Patients to Request a Neurologist for Treatment of Disorders of the Brain, Vascular, Nerve or Neuromuscular System
- Educate Primary Care Physicians and Allied Health Professionals to Recognize Signs and Symptoms & Build Case for Referral to Neurologist as Cost-Effective
- Facilitate Outcomes Research to Support Case for Referrals in Managed Care Settings
- Educate Congress & Administration, Including State Level Policy Makers; re. Advances in Neurology, Need for Continuing Research, & Appropriateness of Reimbursing for Neurology Treatments
- Mobilize AAN Members as Spokespersons for the Specialty

Brain Matters

Some Specific Details: General Public Education

- Brain Matters: 10 Most Common Signs & Symptoms of Neurological Disorders
- Brain Matters: Patient Education Center
- Writer's Conference
- Journalism Awards
- Health Editor Newsletter
- Neurology News Center/Media Tours
- Be Head-Strong! -- Tips for a Healthy Brain

Brain Matters

The Brain Attack Campaign
Brain Attack Coalition Will Advance Efforts to Ensure Rapid and Effective Stroke Treatments for Patients

- Substantial Funding Already Exists
- Barksdale Ballard Will Help Mobilize Academy Members to Carry the Messages:
  - Raise Awareness of Urgency of Stroke Treatment
  - Educate Health Care Providers (EMTs, Paramedics, Family Physicians, Internists, ER Staff, 911 Dispatchers, Etc.)
  - Educate the General Public; re. Signs & Symptoms to Make Sure They Seek Immediate & Appropriate Help
- Alliance with the American Heart Association and the National Stroke Association Will ensure that the Public is educated about the Warning Signs and Prevention of Stroke

Brain Matters

Initiative II: Management of Concussion in Sports (Based on a Practice Parameter developed by the Quality Standards Subcommittee of the Academy's Practice Committee)

- Excellent Opportunity for the AAN to Take Leading Role on a Common, Yet Serious Health Topic
  - Consensus Conference: AAN, AAP, ER, National Sports Organizations, PTOs, Schools, Coaches
  - Major Publicity Opportunity to Launch Massive Public Education Campaign Built Around Practice Guidelines
  - Excellent Sponsorship Opportunities

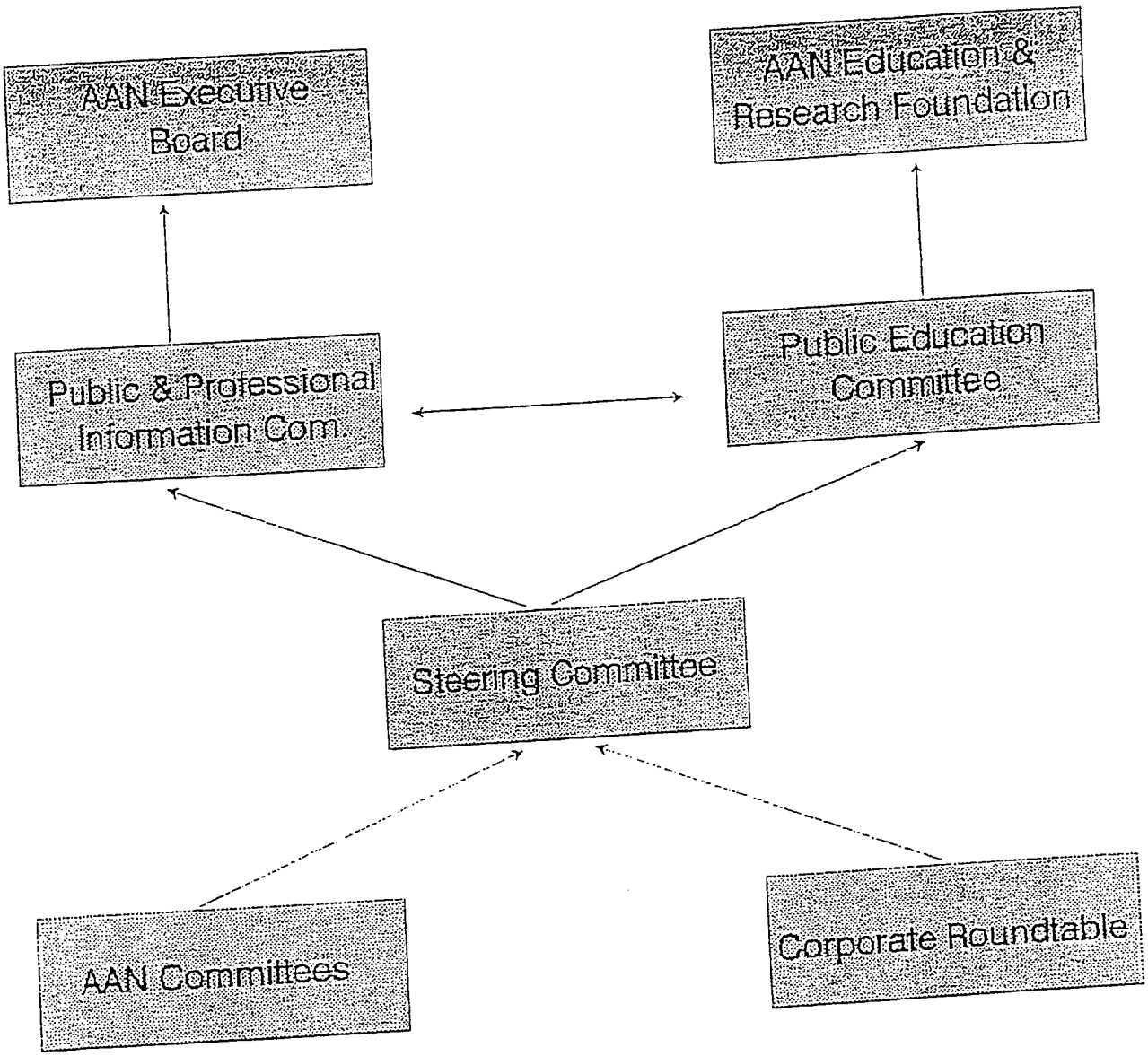
Brain Matters: The Next Step

Development of the Operational Plan to Execute the Brain Matters Campaign

Public Education Decision-Making Process

- AAN Executive Board and AAN ERF Respective PR Committees Review and Approve General PR Plan
- Steering Committee (Made up of AAN President and President Elect; AAN ERF President; PPIC Chair; CRT Representative; Key AAN/Foundation Staff and Barksdale Ballard Representative) Will Be Empowered to Make Day-To-Day Decisions Regarding PR Campaign. This May Include, but Not Limited to:
  - Establishing Priorities for Various Projects
  - Acting On Direct Requests from CRT or Other Corporate Contribution Tied to a Specific Project
  - Initiate Fundraising Efforts to Support Various Projects Within the Campaign
  - Evaluate Other Committee's Ideas to Determine If They Will Be Enhanced by Inclusion in the Campaign

AAN/AAN ERF PUBLIC RELATIONS ORGANIZATIONAL CHART



Brain Matters

What's in it for the AAN?

- Halfway Through Decade of the Brain, Time to Go Public
- Alliance with the AHA and NSA ensures that materials on stroke care and prevention seen by the public are tied to neurology
- Tremendous Breakthroughs in Research and Treatments, But Managed Care Is Shrinking Our Numbers

We must Establish the Value of Our Specialty in the Minds Of Our Many Audiences

TBM Editorial Team/Sleep
Assignment
March 15, 2003

Overall Goal: Thank you for agreeing to serve on the Editorial Team/Sleep that will develop content for The Brainmatters website. You are charged with developing content targeted at newly diagnosed patients with sleep disorders. Our goal is to create a resource that AAN members will feel good about recommending to their sleep disorder patients, and that will be of value to these patients and their families.

Your Assignment: The coordinating committee met recently and agreed on the following outline for each new content area of the web. Please work together as a group to develop this content.

Facts
What Is It
Who Gets It
What Is the Cause
What Are The Symptoms
Living With A Sleep Disorder
How Is It Diagnosed
What Are The Treatments
Prevention

Patient Profile
A feature story about a person who is living with a sleep disorder

Resource Links
To credible information sources for patients/caregivers
To clinical trials
To NJ Patient Page portal
To AAN/other selected patient guidelines

Tasks

Your goal is to complete this project within three months--by June 20. Each team is responsible for:

- Writing first draft content for the Facts section. Keep in mind that web readers prefer content that is concise and easy to read. We will be aiming for a tenth grade reading level. First drafts will be edited by an AAN staff editor to ensure consistency, and reviewed and approved by the coordinating committee before they are final.

- Selecting a patient to profile. We need to find a patient who is typical of someone with their condition, who has an interesting story, is doing well in managing their condition, and who has a positive attitude. The patient that we select must be willing to share their story and photograph with a public audience. The Foundation has hired Margaret Nelson, a freelance writer that we worked with on the USA Today project, to interview the patient and write their story for the web. The Foundation will also arrange to have the patient photographed.

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- Review and select appropriate resource links. In reviewing links, please choose sites that are "non-denominational" (i.e., sites that are informational, not promotional in nature). Please limit your recommendations to only the best!

Getting the Work Done

All work will be done by conference call and e-mail. Staff support will be provided by the Foundation to set up meetings, document results, and assist with administration.

On our first call, we will:

- Discuss the assignment
- Recruit a team leader
- Establish a rough timeline and accountabilities
- Determine how best to communicate with each other

In general, we would suggest:

Month 1:
Develop key information points
Write first draft
Identify patient to profile
Identify patient to serve on committee

Month 2:
First draft reviewed and edited by AAN staff and coordinating committee
Patient profile interview/first draft completed and sent to editorial team for review/edits

Month 3
Patient photo taken
Message testing with AAN members/patients
All copy finalized and approved by editorial committee and coordinating committee

THE BRAIN MATTERS

STROKE INITIATIVE

Fact Sheet

Overview: **The Brain Matters Stroke Initiative** is a professional and public education program developed by the American Academy of Neurology. The **Initiative** is committed to reducing time to treatment of stroke patients, enhancing care and improving patient outcomes by:

- significantly improving public recognition and immediate reporting of stroke symptoms;
- improving pre-hospital response times; and
- preparing and assisting the healthcare community to treat acute stroke emergently.

The **Initiative** will work to create a national partnership among major medical organizations to develop joint education, training and communications programs to foster stroke emergency response teams and ensure the availability of prompt clinical evaluation and appropriate treatment. In addition, it will work to strengthen and expand the current efforts of a variety of national organizations that are currently active on this issue and to address the needs of special populations in recognizing the warning signs, symptoms, prevention and treatment of stroke.

Campaign Messages:

Professional Education Messages

- A stroke is a Brain Attack
- Communities and hospitals must institute emergency response systems for transport, triage and treatment personnel.
- Education and training -- on a national and local level -- are important to the establishment of rapid response stroke teams and systems.

Public Education Messages

- A stroke is a Brain Attack -- requiring emergency medical attention.
- Stroke is a medical emergency -- call 911!
- Stroke symptoms include:
  - Numbness, weakness or paralysis of face, arm, or leg -- especially on one side of the body
  - Sudden blurred or decreased vision
  - Difficulty speaking or understanding words.

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Campaign Activities:

Professional Education

- Regional CME stroke team workshops
- How To kit providing video, slides, fact sheets, and discussion guides
- Satellite video conference providing joint education to medical professionals and hospitals
- Professional monograph on acute stroke management
- Acute stroke database for collection of data and analysis of new stroke treatment regimens
- Education at annual meeting of the American Academy of Neurology

Public Education

- Public service announcements (PSAs)
- Public education launch event in Washington, D.C.
- Educational video
- Establishment of a network of third-party organization supporters representing allied health professionals, consumers, managed care, minority, women, civic and other interests

Partners: The following organizations are guiding the **Initiative:**

- American Academy of Neurology
- American Association of Neuroscience Nurses
- American Association of Neurological Surgeons
- American College of Emergency Physicians
- American College of Radiology
- American Heart Association
- American Society of Neuroimaging
- National Institute of Neurological Disorders and Stroke
- National Stroke Association

Sponsors: Funding was provided by an educational grant by founding sponsors Genentech, Inc., and Janssen Pharmaceutica, Inc.

Additional Information: For more information about **The Brain Matters Stroke Initiative**, call Julie Emnett, Director of Communications; The American Academy of Neurology; 612/623-2420.

The Brain Matters campaign is a collaborative public education effort between the American Academy of Neurology, the AAN Education and Research Foundation and the Corporate Roundtable.

This brochure was made possible by an educational grant from Novartis Pharmaceuticals

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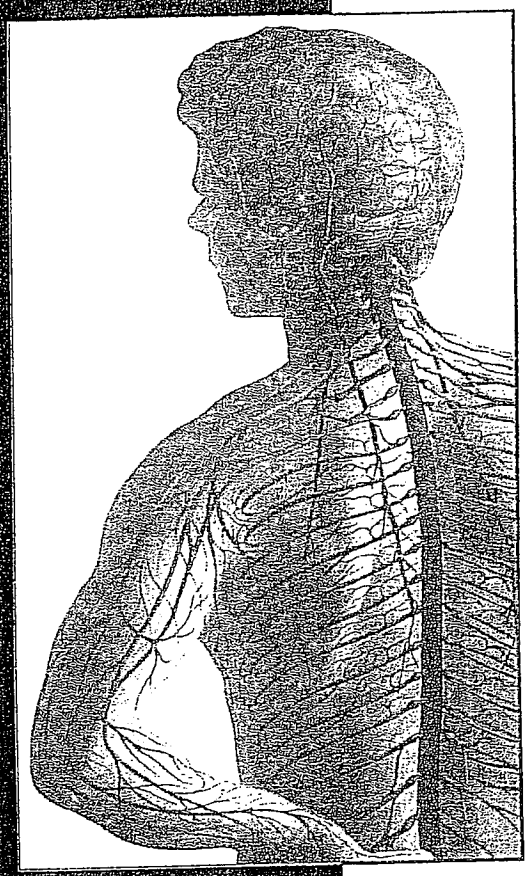
ALZHEIMER'S



WHAT YOU SHOULD KNOW

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WHAT IS ALZHEIMER'S DISEASE?

Alzheimer's disease (AD) is a debilitating, life-altering disease that attacks the brain. Its primary symptom is progressive memory loss, but difficulties with vision, language skills, and emotional control are also common. The progressive deterioration continues for five to 20 years. At some point, a person with Alzheimer's disease will require 24-hour care and assistance with daily activities such as eating, grooming, and toileting. Because its impact on the affected person is so great, it profoundly affects family and caregivers.

About four million Americans have Alzheimer's disease. That number will likely increase to at least seven million by the early 21st century unless researchers find a cure or a way to prevent the disease.

Age is clearly the major risk factor for Alzheimer's disease. While only five percent of those over 65 have the disease, nearly half the population over 85 have it. Genetics also appears to play an important role.

The course of Alzheimer's disease varies tremendously, but is always progressive. The disease claims more than 100,000 lives per year — the 4th leading cause of death for adults.

WHAT ARE THE SYMPTOMS?

Symptoms usually begin with memory loss, especially of recent events. For instance, the person will repeat stories in the same conversation. In the early stages, Alzheimer's patients cannot learn new information. The symptoms may include misplacing objects or becoming lost in familiar neighborhoods.

As the disease progresses, people with Alzheimer's disease become increasingly confused and disoriented. Some cannot find words in conversation, and cover by using automatic phrases and clichés. Another common symptom is personality and behavioral changes such as unusual agitation, depression, and paranoia. Judgment and common sense increasingly become impaired.

Eventually, patients forget how to perform simple tasks, like combing their hair or brushing their teeth. They often lose the ability to recognize faces and objects. Even well remembered information, such as the names of children, is wiped off the memory's blackboard. Personality changes are more distinctive — ranging from progressive passivity to marked agitation. About half of patients have paranoid delusions, such as thinking that caregivers or family members are impostors or that their home is not their real home.

About 20-30 percent of Alzheimer's patients develop symptoms such as slow movement and trembling. Seizures occur in 10-20 percent of patients, often late in the disease.

Unfortunately, at least in the early stages, many people fail to recognize these symptoms as something wrong. They may mistakenly assume that such behavior is a normal part of the aging process; it isn't. Symptoms may develop gradually and go unnoticed for a long time. Some people don't act even when they know something is wrong.

It is important to see a physician when you recognize or suspect Alzheimer's symptoms. Only a physician can properly diagnose the person's condition, which could be a treatable form of dementia. Even if the diagnosis is Alzheimer's disease, new treatments are available for patients as is assistance for caregivers.

HOW IS ALZHEIMER'S DISEASE DIAGNOSED?

There is no simple test to diagnose Alzheimer's disease; a definite diagnosis can only be made by examining brain tissue, usually at autopsy. The patient's brain will be permeated with deposits of amyloid. Sick brain cells are filled with tangles of fibrillary material. While these changes occur in normal aging, a much greater density is found in Alzheimer's patients, which may cause brain cells to stop communicating with each other.

When Alzheimer's disease is suspected, it is important to have a thorough medical and neurological evaluation to identify treatable disorders with Alzheimer's-like symptoms. Illnesses like depression, hypothyroidism, vitamin B12 deficiency, hydrocephalus, cerebral vasculitis, neurosyphilis, AIDS, and stroke can cause dementia, as can alcohol and some medications.

The comprehensive evaluation necessary to rule out these causes and to make a probable diagnosis of Alzheimer's disease includes a complete health history, physical examination, neurological and mental status assessment and other tests including analysis of blood and urine, electrocardiogram and chest x-rays. Documenting symptoms and behavior over time, in a diary fashion, will help the physician understand the person's illness. The physician may order additional tests as needed including computerized tomography (CAT) scan, electroencephalography or a magnetic resonance image (MRI) scan.

WHAT IS THE CAUSE?

The cause of Alzheimer's disease is currently unknown. It is not contagious. Genetic factors and aging appear to play an important role. Because a combination of factors are believed to be responsible for most forms of Alzheimer's disease, genetic testing usually is not recommended.

Alzheimer patients who have at least one other relative with the disease are categorized as "familial." "Familial" does not necessarily mean that it is genetic; family members may have been exposed to something in the environment that caused the disease. If a person has Alzheimer's disease and no other family members are known to have been affected, they are said to have "sporadic" Alzheimer's disease.

As stated earlier, most cases of Alzheimer's disease occur in those after age 65, but a small percentage of cases develop at an unusually young age – some people are diagnosed in their fifties, some in their forties, some even as young as their thirties. This form of the disease is called early-onset Alzheimer's disease, affecting from 1 to 10 percent of all cases.

A variation on chromosome 19, called APOE-e4, appears to be a risk factor for Alzheimer's. This gene variation is present in about 15 percent of the general population, but occurs in 50 percent of those with late-onset Alzheimer's disease. It is more than three times as common in Alzheimer's patients than in people without the disease. Although people with this so-called e4 type appear to be more susceptible to the disease, they will not necessarily get it.

WHAT ARE THE TREATMENTS?

While currently there is no cure for Alzheimer's disease, there are some treatments that help manage the symptoms.

Tacrine and donepezil hydrochloride are currently FDA approved for the treatment of mild to moderate Alzheimer's disease. Neither drug slows the disease progress, but can ease symptoms in some patients by inhibiting the breakdown of a brain chemical called acetylcholine. Acetylcholine is in short supply in Alzheimer's patients. It is not yet clear which patients will benefit from these drugs.

There are also many approved medications for the behavioral symptoms, including drugs to control depression, agitation, anxiety, and delusions. Specific strategies for some of the physical and behavioral problems can improve a patient's quality of life. Vision and hearing problems, for instance, should be corrected.

Families and friends can help by recognizing that Alzheimer's disease impacts not only the patient, but also the primary caregiver. To take the best care of the Alzheimer's patient, the primary caregiver must

take care of themselves. They should be encouraged to find out more about the disease, avoid isolation and seek support from family, friends, and professionals.

While there is no known way to prevent Alzheimer's disease, researchers believe there are several things that will help keep your brain healthy:

- Avoid harmful substances – Excessive drinking and drug abuse are thought to damage brain cells.
- Challenge yourself – Read widely; keep mentally active and learn new skills. This strengthens the brain connections and promotes new ones.
- Trust yourself more – If you feel as you have control over your life, your brain chemistry actually improves.

HOPE THROUGH RESEARCH

Research, especially using animal models of the disease, provides tremendous hope for patients. The effects of estrogen hormones, anti-inflammatory agents, vitamin E, and other common medications are under intense study at this time.

Experimental treatments are currently being tested in multicenter clinical drug trials. One of the most promising is neurotransmitter research, or replacing the cells that produce neurotransmitters in the brain that have been destroyed by the disease. Neurotransmitters are chemicals that carry messages between brain cells. Participation in clinical trials can be highly rewarding because of the frequent contact with and support from health care providers. However, they usually require that a portion of the patients receive placebo rather than active medication. A placebo – often a sugar pill – is an inactive substance that looks like the test drug. Most state Alzheimer's centers, federally funded Alzheimer's centers and many physicians specializing in Alzheimer's disease participate in these trials.

Please contact the AAN Education and Research Foundation to contribute to the fight against Alzheimer's disease and other neurological disorders. Only through continued research can we hope for more treatments and a cure. Call (612) 623-2412.

FOR MORE INFORMATION:

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The Brain Matters campaign is a collaborative public education effort between the American Academy of Neurology, the AAN Education and Research Foundation and the Corporate Roundtable.

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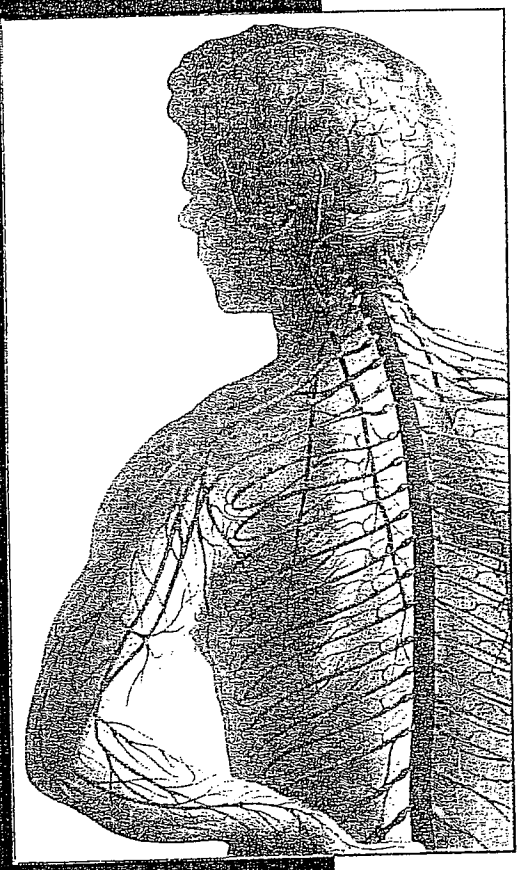
AMYOTROPHIC LATERAL SCLEROSIS



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AMYOTROPHIC LATERAL SCLEROSIS

WHAT IS ALS?

Amyotrophic lateral sclerosis (ALS) is a progressive disease of the nervous system. The cause is not known and there is no cure, although progress is being made on both fronts. ALS is also known as Lou Gehrig's disease after the famous baseball player who died from it.

ALS attacks motor neurons, which are among the largest of all nerve cells in the brain and spinal cord. These cells send messages to muscles throughout the body. In ALS, motor neurons die and the muscles do not receive these messages. As a result, muscles weaken as they lose their ability to move. Eventually, most muscle action is affected, including those which control swallowing and breathing, as well as major muscles in the arms, legs, back and neck. There is, however, no loss of sensory nerves, so people with ALS retain their sense of feeling, sight, hearing, smell and taste. The mind is not affected by this disease and people with ALS remain fully alert and aware of events. The course of ALS is extremely variable and it is difficult to predict the rate of progression in any single patient. For the majority of people with ALS, weakness tends to progress over a three-to-five year period.

ALS can strike anyone, at any age, but generally ALS occurs between the ages of 40 and 70. According to the National Institutes of Health, some 4,600 people in the United States are newly diagnosed with ALS each year. About 4 to 6 people per 100,000 worldwide get ALS. In a small percentage of patients, ALS is genetic.

WHAT ARE THE SYMPTOMS?

The first signs of ALS are often arm and leg weakness, muscle wasting and faint muscle rippling. These symptoms occur because muscles are no longer receiving the nutrient signals they need for growth and maintenance — a result of motor neurons dying. ALS nerve degeneration may also cause muscle cramps and vague pains, or problems with speech and swallowing. Some people with the disease may lose some control over their emotional responses. They may laugh or cry much more easily than in the past. Eventually, all voluntary muscle action is affected.

HOW IS ALS DIAGNOSED?

There is no specific test for diagnosing ALS. However, several tests — including nerve conduction studies and electromyogram (EMG) — are used to measure how well and quickly the nerves are working. Ruling out other causes of muscular weakness is important because ALS often mimics other treatable diseases. Diagnosis requires special skills and neurologic tests. People with ALS symptoms usually are referred to neurologists, who specialize in the nervous system. Diagnosis may take several months since an important part of the diagnostic process is to confirm disease progression.

WHAT CAUSES ALS?

The cause of ALS is unknown. It attacks its victims at random. However, it was recently discovered that five to ten percent of those with ALS show a definite genetic pattern. In this rare form, about one-half of the offspring may develop ALS. These people show a gene defect that affects an enzyme called superoxide dismutase. This enzyme eliminates toxic substances called free radicals. Free radicals can cause nerve cells to die and are associated with a number of diseases and even implicated in aging itself. For most people with ALS, the vast majority of their children are not at any greater risk of developing this disease than the general population. This type of ALS is often called "sporadic ALS" due to its unpredictable nature.

ALS researchers have found no difference between the symptoms and disease progression in the sporadic and genetic forms of ALS. Therefore, since the genetic and acquired forms of ALS appear to be similar, an understanding of the cause of the genetic form could lead to treatment for all forms of the disease.

TREATMENT

While there is no cure for ALS, research to solve the ALS puzzle is ongoing. Scientific advances have led to approval of the first treatment for the disease – a medication that may increase survival time. Other treatments under investigation include several nerve growth factors which may help maintain quality of life by maintaining nerve function. While each of these therapies represent a step forward for people with ALS, a cure remains to be discovered.

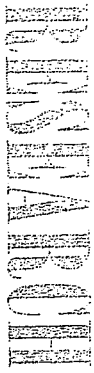
For the majority of people with ALS, the primary treatment remains the management of ALS symptoms. Patients need to take an active role in the design of their treatment regimen. Ideally, ALS management involves physical, occupational, speech, respiratory and nutrition therapy. For instance, certain drugs and the application of heat or whirlpool therapy may help to relieve muscle cramping. Exercise can help maintain muscle strength and function. Exercise, however, is recommended in moderation. Drugs also may be used to help combat fatigue, but in some patients may worsen muscle cramps.

As the disease progresses, various assistive devices will help persons with ALS maintain their independence and ensure personal safety. For example, an ankle/foot brace can improve function and conserve energy, as well as help avoid injury. When neck, trunk and shoulder weakness makes walking or sitting difficult, cervical collars, perhaps with an additional chest and head strap, provide helpful support. A reclining chair is preferable to a headrest to relieve fatigue of neck muscles. There are also numerous devices to assist in feeding, dressing and maintaining personal hygiene. Eventually, more substantial equipment, such as wheelchairs, scooters, lifts and hospital beds may be required.

It is important to know that speech therapists can help with speech and swallowing difficulties as they develop. Also, drug treatments can help patients who develop excessive saliva and drooling. Family members of people with ALS should be instructed in the Heimlich maneuver to provide assistance in a life-threatening choking episode. Feeding tubes may be necessary to maintain nutrition, as may breathing devices when the disease affects the muscles of the chest. However, with these supportive devices, there are physical, emotional and financial implications, and their use should be discussed with a physician well in advance of when the need arises. Managing the symptoms is a process that is challenging for people with ALS, their caregivers, and their medical team.

Of all the disabilities that affect a person with ALS, one of the most devastating and most common is the progressive loss of the ability to communicate. However, advances in computer technology mean that persons with ALS today have vital new electronic communications options that can be adapted to their individual capabilities.

PROGRESS THROUGH RESEARCH



Significant progress is being made in the study of ALS. Although there is still no cure, recent clinical trials have shown that some drugs affect nerve cell activity and may increase the survival time for people with ALS. Newly developed animal models of the genetic form of the disease, so-called transgenic ALS mice, offer neurologic researchers the ability to test therapies in mice. There is great hope that this and other neuroscientific advances will lead to a cure in humans. Talk with your doctor about being involved in future clinical trials or about the drugs currently available for the treatment of this disease.

Please contact the AAN Education and Research Foundation to contribute to the fight against ALS and other neurological disorders. Only through continued research can we hope for more treatments and a cure. Call (612) 623-2412.

FOR MORE INFORMATION:

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(818) 340-7500
(800) 782-4747 Patient Hotline

Muscular Dystrophy Association
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(602) 529-2000

The Brain Matters campaign is a collaborative public education effort between the American Academy of Neurology, the AAN Education and Research Foundation and the Corporate Roundtable.

This brochure was made possible by an educational grant from Berlex Laboratories.

The Brain Matters

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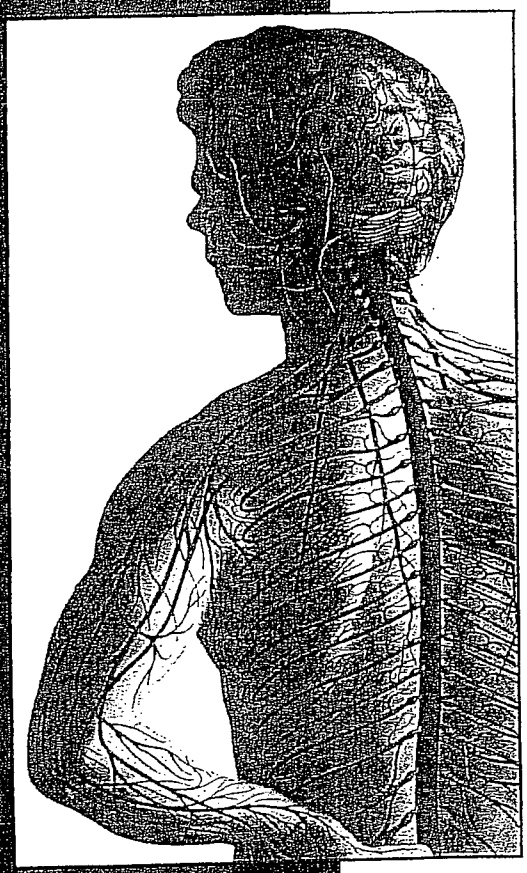
MULTIPLE SCLEROSIS



WHAT YOU SHOULD KNOW

The Brain Matters

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MULTIPLE SCLEROSIS

WHAT IS MULTIPLE SCLEROSIS?

Multiple sclerosis (MS) is a common disabling neurologic disorder of young adults, affecting at least 300,000 Americans. The average age of diagnosis is 30, but it typically starts anywhere between the ages of 15 and 50. Occasionally, the disease begins in children or in older adults. Women are affected at least twice as often as men. It is more common in persons of Northern European heritage, and people with MS are distributed in a remarkable geographic pattern. The highest density occurs in those living furthest from the equator, that is, in temperate zones.

There are several types of MS. Most people with MS begin with relapsing remitting disease – that is, it starts with an abrupt onset of neurological problems like numbness or tingling, weakness, or unsteady gait, that either improve spontaneously or with treatment of the symptoms – only to come back again or "relapse." Until recently, when the first treatment became available, most people with relapsing remitting MS eventually developed a secondary or chronic progressive form of the disease. Ultimately, over one half of people with MS will experience a progressive course.

In general, MS is not life threatening. The life expectancy of those with MS is only slightly less than the general population. When premature death occurs, it is usually the result of complications such as pneumonia or other infections.

The disease is not contagious, and its course is very unpredictable. There is tremendous variation between patients and in patients in various stages of the disease.

SYMPTOMS

WHAT ARE THE SYMPTOMS?

MS involves inflammation within the central nervous system (the brain and spinal cord), followed by demyelination (loss of the protective myelin sheaths which surround nerve fibers). Myelin is like the insulation surrounding and protecting electrical wires. When the myelin is damaged, nerve impulses are not quickly and efficiently transmitted. As a result of the inflammatory process, lesions (called plaques) develop in the brain and spinal cord causing a variety of neurologic symptoms, such as vision loss, numbness or tingling, weakness, unsteady gait, double vision, fatigue, heat intolerance, partial or complete paralysis and electric shock sensations when bending the neck. These symptoms may go away or may remain after an attack. They may get progressively worse over time. For individuals with progressive forms of MS, these symptoms may gradually worsen over time without rapid or abrupt changes.

Symptoms associated with relapses or attacks usually develop over a period of hours to days, persist for a matter of days or weeks, and then partially or completely disappear with or without treatment. New attacks occur at irregular intervals.

DIAGNOSIS

HOW IS MS DIAGNOSED?

The diagnosis of MS is based on a clinical history and examination showing evidence of multiple neurologic lesions over time, and the lack of an alternative diagnosis. Your neurologist will order tests which will help confirm the diagnosis. Usually a magnetic resonance imaging scan (MRI) of the brain (and possibly the spinal cord) is ordered to seek evidence of additional areas of abnormality. Lumbar puncture (spinal tap) is also helpful to detect characteristic abnormalities of the cerebrospinal fluid. Computer-assisted electrodiagnostic tests called evoked responses may also be used to aid in diagnosis.

CAUSES

WHAT IS THE CAUSE?

The cause of MS is unknown. A combination of inherited and environmental factors may contribute to the disease (see below). MS is slightly more likely when there is a close relative with the disease, implying a genetic predisposition. Exposure to a triggering agent, perhaps a virus, may start this disease. There is strong evidence that MS is immune-mediated, that is, that the person's own immune system attacks the central nervous system (an auto-immune disease). Common viral infections may trigger relapses or attacks.

While there is a genetic susceptibility or predisposition to multiple sclerosis which increases the likelihood of the disease, it is not truly inherited in the general population. Researchers estimate that instead of a 1 or 2 per 1000 chance in the United States of getting MS, in families where MS already exists, the risk of another person getting the disease is about a 3 in 100 chance. This indicates a higher risk, but is not considered a major factor in the disease.

TREATMENTS

WHAT ARE THE TREATMENTS?

Currently, there is no prevention or cure for MS. However, this is a promising time for people with MS as several new medications that affect the underlying disease process have been approved or are awaiting approval by the Food and Drug Administration. Current treatments are divided into three categories:

1. Those which are symptomatic. These include medications to decrease muscle stiffness, improve the symptom of fatigue, and control bladder symptoms, pain, sexual dysfunction, etc.

2. Those which modify attacks when they occur. These are primarily ACTH (an adrenal hormone) and corticosteroids (a synthesized adrenal hormone) which can shorten an attack. Doctors today most often prescribe large doses of steroids given intravenously for several days. Longer-term steroid use, however, is not effective in slowing progression.

3. New medications which modify disease activity. The first of these is interferon beta 1b (Betaseron), which was approved for MS treatment in 1993. It is administered by a subcutaneous (under the skin) injection every other day, and it has been shown to reduce the frequency and severity of exacerbation. Two other drugs, interferon beta 1a (Avonex) and copolymer 1 (Copaxone), are pending approval by the FDA.

Many important clinical trials are now in progress, and hopefully positive results will be achieved in several of these ongoing studies. People can learn about these trials by contacting the National Multiple Sclerosis Society. Many find it advantageous to participate in such studies. For them, the inconvenience and possible expense of participating is balanced by the opportunity to try new therapies and to be followed regularly by leaders in the field.

Living with MS poses tremendous physical and emotional burdens on those affected by the disease, as well as their loved ones and caregivers. The unpredictability of the condition and its occurrence in the prime of life increase the psychological toll. Continued research into understanding the disease, as well as the intense activity in the area of experimental treatments, now offers real hope for an improvement in the lives of those affected by MS.

Research has shown that MS attacks occur less commonly during the second and third trimester of pregnancy and slightly more often in the period immediately following delivery. In general, pregnancy does not have a serious, long-term, adverse impact on women with MS. Decisions about pregnancy are individual. People with MS are encouraged to discuss the issue with their neurologist and other counselors.

PROGRESS THROUGH RESEARCH

Besides clinical trials of promising therapies, neurologists and neuroscientists are involved in laboratory research to develop more effective treatments. Most potential treatments are discovered and tested in an animal model of MS called experimental allergic encephalomyelitis (EAE) before being tried in human studies.

RESEARCH

Please contact the AAN Education and Research Foundation to contribute to the fight against MS and other neurological disorders. Only through continued research can we hope for more treatments and a cure. Call (612) 623-2412.

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The Brain Matters campaign is a collaborative public education effort between the American Academy of Neurology, the AAN Education and Research Foundation and the Corporate Roundtable.

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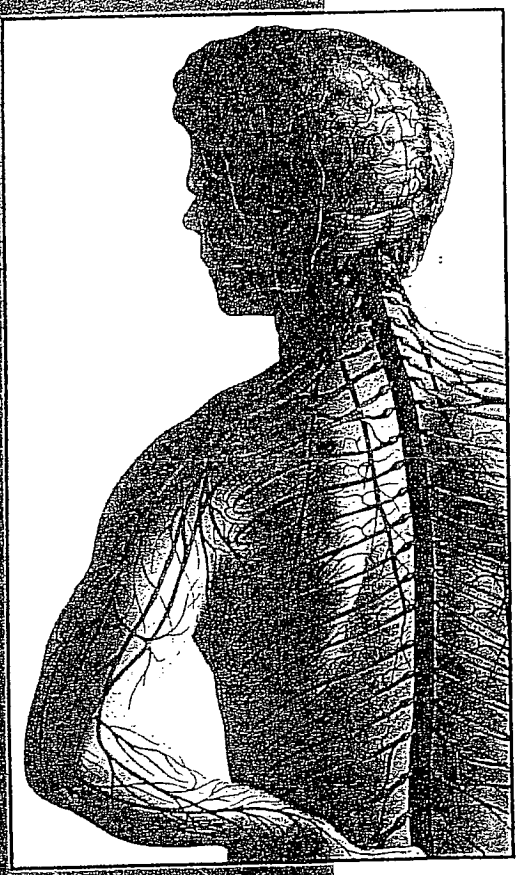

WHAT YOU SHOULD KNOW

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ROLLAND

WHAT IS EPILEPSY?

Epilepsy is a family of more than 40 neurological conditions that share a common symptom — seizures. It affects about 2.5 million Americans and can result from head injury, infection, fever, brain tumors, or other trauma that damages the brain.

Normally, brain cells communicate with each other through electrical impulses that work together to control the body's movements and keep the body's organs functioning properly. When thousands to millions of electrical impulses occur at the same time producing abnormal brain electrical activity, the result can be a seizure. The part of the brain where the abnormal electrical activity occurs determines the type of seizure.

There are over thirty types of seizures, some more severe than others. Some people have seizures that last a short time and cause them to stare off into space, giving the appearance that the person is simply daydreaming. Others may experience a more dramatic seizure (tonic-clonic seizure) where the person loses consciousness and the entire body stiffens and then twitches or jerks uncontrollably.

People of all ages, races, and in all walks of life can develop epilepsy. It affects about one in 100 people. It is not contagious, and it is not a mental illness. Most forms of epilepsy are not inherited, but it may run in some families.

While there is, as yet, no cure for epilepsy, today's treatment options can control most cases. In fact, many people with epilepsy lead normal lives and have no symptoms between seizures. The aim of treatment is to stop the seizures.

WHAT ARE THE SYMPTOMS?

The doctor diagnoses epilepsy after a person has had multiple seizures. The frequency and type of seizure varies from person to person. Some people have more than one type.

The medical community classifies epileptic seizures into two major categories: *partial* and *generalized*. The form a seizure takes depends on the part of the brain in which it occurs and on how widely and rapidly it fans out from its point of origin.

Partial seizures:
If the abnormal electrical activity involves one area of the brain, the seizure is partial. The person may not lose consciousness, but can experience a range of symptoms: sudden jerky movements of one part of the body, such as an arm or leg; sudden fear; facial movements; disturbances or hallucinations of vision, hearing, or smell; nausea, vomiting, or stomach discomfort.

Some types of partial seizures (called complex partial seizures) may cause the person to have a change of consciousness. They may be dazed and confused, unaware of where they are or what they are doing. They may wander around randomly, mumble, and behave in unusual ways. They may exhibit chewing or repetitive arm and hand movements. Moreover, people with this type of seizure will not remember what they have experienced.

Generalized seizures:
When the entire brain is involved, the seizure is generalized. Like partial seizures, there are many different symptoms, body movements, and activities. Some people stare off into space, while others may have a full convulsion with the complete loss of consciousness and jerking movements of limbs (*tonic-clonic* seizures).

Just before having seizures, some people experience an *aura*, which is a sensation or warning of a coming seizure. Some people feel a sense of tension or anxiety, may hear a musical sound, sense an odor or taste, or experience some other change in sensation. Often this aura gives the person time to get to a safe place to avoid injury.

HOW IS EPILEPSY DIAGNOSED?

Because there is no test to diagnose epilepsy, a doctor must rely mainly on interpreting the patient's medical and family history. Thus, it is important that the doctor have experience with and treat people with neurological disorders such as a neurologist. When the patient describes what he or she experienced, and someone who witnessed the seizures describes what he saw, the doctor can often determine what kind of seizure the patient experienced and treat it.

The doctor asks about the patient's past medical history, the mother's pregnancy, and the family's medical history. The doctor will do general physical and neurological examinations to look for the underlying cause of the seizure.

The doctor usually orders an electroencephalogram (EEG) test, a painless recording of the patient's brain waves. The EEG, however, may appear normal even if the patient has epilepsy. Another painless test—a magnetic resonance imaging study or MRI—may reveal scar tissue or a structural abnormality within the brain, helping the doctor to make a diagnosis of epilepsy.

WHAT CAUSES EPILEPSY?

There is no single cause of epilepsy, and in 70% of cases, no known cause is ever found.

Some of the known causes of epilepsy are:

- Injury to the brain before, during, or after birth
- Infections that damage the brain
- Toxic substances that affect the brain
- Injury and lack of oxygen to the brain
- Disturbance in blood circulation to the brain (stroke and other vascular problems)
- Metabolism or nutrition imbalance
- Tumors of the brain
- Hereditary disease affecting the brain
- High fever
- Other degenerative diseases

TREATMENTS

Most major epileptic seizures (generalized or tonic-clonic) last only a minute or two and demand little of the bystander. All that is necessary is to let the seizure run its course and to ensure that the person is in no physical danger and can breathe.

However, a person who experiences repeated seizures and does not recover consciousness between attacks should get immediate medical attention. This type of repeated seizure is called status epilepticus. This is life threatening, and could also cause brain damage.

First Aid

The goal of first aid is to keep the person safe:

- Keep calm, help the person to the floor, and loosen clothing around the neck
- Remove sharp or hot objects that could injure
- Turn the person on one side so saliva can flow out of the mouth
- Place a cushion such as a folded coat under the head
- Do NOT put anything into the person's mouth
- After the seizure, allow the person to rest or sleep if necessary
- Some people will be confused or weak after a seizure. They may need help getting home
- Contact the parent or guardian if a child had the seizure

People often wonder whether they should call an ambulance when someone has a seizure. If you know the person has epilepsy, an ambulance is probably unnecessary unless the seizure continues for more than five minutes. If you don't know, or if the person is pregnant, diabetic, or seems otherwise ill, play it safe and call for help.

The most common treatment of epilepsy is daily use of anti-convulsant drugs, which allow many people with epilepsy to enjoy a healthy life and continue normal activities. The drugs, prescribed alone or in combination, are adjusted over time until the best combination is found for each person. Many people with epilepsy must take their anti-convulsant drugs for the rest of their lives to prevent further seizures. However, the doctor may advise a slow withdrawal of the drug if a person has had no seizures for several years.

Those for whom anti-convulsant drugs fail to control the seizures, surgery to remove injured brain tissue may be possible. A thorough evaluation including the recording of a seizure with EEG, video and neuropsychological testing is performed to determine surgical candidacy. Other surgical techniques are being developed that offer new hope to people with uncontrollable epilepsy.

Epilepsy treatment should include discussions about the physical (e.g., side-effects), social, and emotional problems that can accompany the disorder. These discussions should involve family and individual counseling and education. In addition, information about epilepsy should be shared with schools, employers, and friends. Women with epilepsy should seek medical counseling prior to and during pregnancy.

State regulations mandate that persons who suffer altered consciousness due to a seizure abstain from driving a motor vehicle for a specific period thereafter. The period varies from state to state.

PROGRESS THROUGH RESEARCH

Epilepsy research has focused on finding the cause of epilepsy and on understanding ways to accurately diagnose and treat it. Researchers continue to study the chemical and electrical changes that occur within the brain cells. Clinical trials of new drugs are constantly underway, and new surgical procedures are being developed.

Among the new drugs being introduced are some that inhibit or change the brain cell activity that causes seizures. These are new strategies for seizure control and mean that doctors will be able to offer new choices to prevent previously difficult to control seizures.

In addition to developing new drugs, researchers are taking a fresh look at some of the ideas that have been part of epilepsy treatment for many years. *It is important that patients talk with their neurologist if they wish to pursue these lines of treatment.* For example, the ketogenic diet, high in fat and low in carbohydrates and protein, creates a condition in the body known as "ketosis," that has been helpful in controlling seizures, particularly in children. Researchers are looking at the exact mechanism of action of the ketogenic diet to shed new light on the biochemical mechanisms of epilepsy.

Surgeons have found that implanting a small device in the body that gives off electronic signals to the brain can stop seizures. This treatment has been especially promising for those with uncontrollable epilepsy.

Please contact the AAN Education and Research Foundation to contribute to the fight against epilepsy and other neurological disorders. Only through continued research can we hope for more treatments and a cure. Call (612) 623-2412.

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The Brain Matters campaign is a collaborative public education effort between the American Academy of Neurology, the AAN Education and Research Foundation and the Corporate Roundtable.

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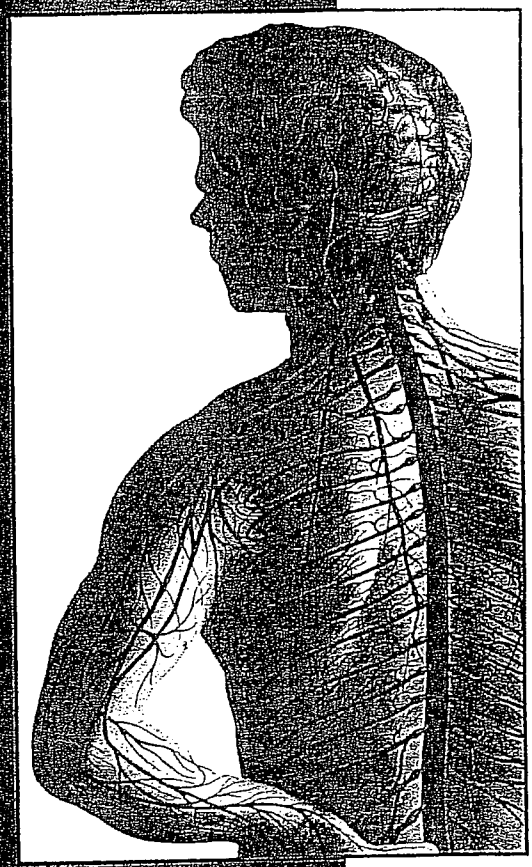
STROKE



WHAT YOU SHOULD KNOW

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STROKE

WHAT IS STROKE?

A stroke, or brain attack, is caused by the sudden loss of blood flow to the brain or bleeding inside the head. Each can cause brain cells to stop functioning or die. When brain cells die, the function of body parts they control is impaired or lost, causing paralysis, speech problems, loss of feeling, memory and reasoning deficits, coma, and possibly death. Every year, about 550,000 people in the United States suffer a stroke, and about 150,000 die, making it the nation's number three killer after heart disease and cancer. It is the number one cause of adult disability. Stroke risk increases sharply with age, doubling every decade after the age of 55. However, stroke can occur at any age – approximately 28 percent of those who have a stroke are under 65 years old.

Fortunately, by recognizing the signs of stroke and seeking immediate medical attention you can help reduce your chances of death and disability.

SYMPTOMS

WHAT ARE THE SYMPTOMS?

Stroke symptoms may not be as dramatic or painful as a heart attack, but the results can be just as devastating. Stroke is an emergency. Get medical attention immediately and know when the symptoms started. Common symptoms include:

- Sudden weakness, numbness, or paralysis of the face, arm, or leg (especially on one side of the body)
- Sudden loss of speech or difficulty talking
- Sudden difficulty understanding language or confusion
- Sudden loss of vision (in one eye or loss of vision to one side) or blurred vision
- Sudden, severe headache with no apparent cause
- Sudden loss of balance or coordination, often associated with dizziness

Call 911 immediately if you or someone you know experiences any of the above warning signs. Jot down the time the symptoms started. Sometimes these warning signs occur for only a few minutes and then resolve. Even if this happens, or if you think you are getting better, call for help.

CAUSES

WHAT CAUSES A BRAIN ATTACK?

Ischemic stroke is caused by an interruption of blood flow to the brain, while hemorrhagic stroke is caused by bleeding inside the head. The following defines the various types of stroke:

- Ischemic – blockage of brain blood vessels, including:
  - — Embolic – clots travel from the heart or neck blood vessels and lodge in the brain
  - — Lacunar – small vessels in the brain are blocked, often due to high blood pressure or diabetes damage
  - — Thrombotic – clot forms in the brain blood vessels often due to arteriosclerosis
- Hemorrhagic – bleeding into or around the brain, including:
  - — Subarachnoid – weak spots on brain arteries burst and blood covers the brain
  - — Bleeding into the brain – blood vessels in the brain break because they have been weakened by damage due to high blood pressure, diabetes, and aging

When blood cannot get to brain cells, they die within minutes to a few hours. Doctors call this area of dead cells an infarct.

The lack of normal blood flow to brain cells sets off a chain reaction called the "ischemic cascade." Over hours, this chain reaction endangers brain cells in a progressively larger area of brain where

blood supply is compromised but not completely cut off. Prompt medical treatment offers the best chance of salvaging this region of brain cells, called the "penumbra."

WHAT ARE THE TREATMENTS?

Immediate medical care is critical. New treatments work only if given within a few hours after the onset of a stroke. For example, a clot-busting drug recently approved by FDA must be given within three hours.

Before treatment, the neurologist or emergency physician must carefully examine the patient to determine the patient's condition and what caused the stroke. Diagnostic tests to determine treatment could include:

- Neurologic exam
- Brain imaging tests to determine the type, location and extent of the stroke (CT and MRI scans)
- Tests that show blood flow and bleeding sites (angiography and carotid and transcranial ultrasound)
- Blood tests for bleeding or clotting disorders
- EKG or an ultrasound examination of the heart (echocardiogram) to identify cardiac sources of blood clots that can travel to the brain
- Tests that gauge impairments on a functional scale

Once the doctor completes these tests, the treatment is selected. For all stroke patients, the aim is to prevent further brain damage. If the stroke is caused by blockage of blood flow to the brain, treatment could include:

- Drugs that thin the blood, including anticoagulants (coumadin) and antiplatelet medications (aspirin or ticlopidine)
- Drugs that break up clots (thrombolytics)
- Surgery that cleans the insides of blood vessels (endarterectomy)
- Drugs that stop the chain reaction of damage from the ischemic cascade (neuroprotective agents, promising but still experimental)
- Procedures which dilate blocked blood vessels

If the stroke is caused by bleeding, treatment could include:

- Drugs that maintain normal blood clotting
- Surgery to remove blood in the brain or decrease pressure on the brain
- Surgery to fix the broken blood vessels
- Blocking off bleeding vessels with a balloon or coil
- Drugs that prevent or reverse brain swelling

After having a stroke, many people will be left with some disability. The disability depends on the size and location of the stroke. The right side of the brain controls the left side of the body and in right-handed individuals it is important for attention and visual-spatial skills. The left side of the brain controls the right side of the body and in right-handed individuals (and 50 percent of left-handed individuals) controls language – speaking and understanding. Language disorders are also called "aphasias."

Rehabilitation helps restore functions lost from damage due to stroke. During rehabilitation, most patients will improve to some degree, but many do not recover completely. Unlike skin cells, brain cells that die do not recover and are not replaced by new cells. However, the human brain is adaptable and patients can learn new ways of functioning, using other, undamaged brain cells. This stage is often a challenge as the patient and family work as part of the medical team.

A stroke patient's rehabilitation team may include physical, occupational, and speech therapists; nurses; and doctors. Most of the improvement will take place in the first three to six months of the rehabilitation process, but some patients can make excellent progress over longer periods of time.

PREVENTION

HOW IS STROKE PREVENTED?

Some risk factors — age, sex, race, and a history of stroke in the family — cannot be changed, but others can be controlled. Most controllable risk factors relate to the health of the heart and blood vessels. The following can help prevent stroke:

- Regular medical check-ups
- Controlling high blood pressure
- Don't smoke – if you do smoke, stop
- Treating heart disease, especially an irregular heart beat called atrial fibrillation (AF)
- Improving diet: Avoid excess fat, salt, and alcohol
- Exercising
- Controlling diabetes
- Seeking immediate medical attention for warning signs of stroke

RESEARCH

PROGRESS THROUGH RESEARCH

A massive effort is underway throughout the United States and the world, involving thousands of scientists studying all aspects of stroke: genetic factors; new diagnostic tools to detect early stroke; drugs and techniques to prevent or reduce stroke; drugs to improve stroke recovery; new ways of opening blocked blood vessels; and improved methods in prevention and rehabilitation. To date, the most significant progress has been increased understanding and prevention of the causes of stroke and improved emergency care of stroke patients. Much of this progress and all new treatments have come from studies using animal models of stroke.

Continued research is needed and should improve prevention and survival of stroke.

Please contact the AAN Education and Research Foundation at (612) 623-2412 to contribute to research on stroke and other neurological disorders. Only through continued research can a cure and new treatments for stroke be found.

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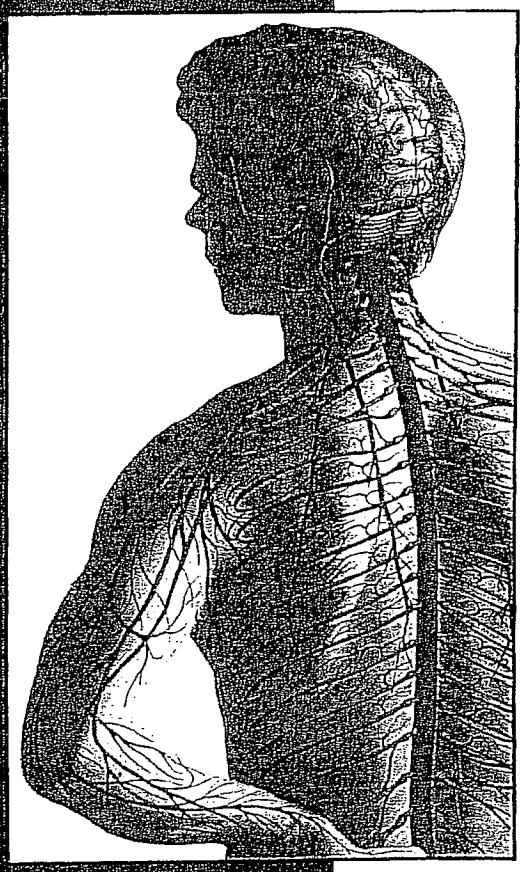
PARKINSON'S DISEASE



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PARKINSON'S DISEASE

WHAT IS PARKINSON'S DISEASE?

Parkinson's disease is a slowly progressive, neurodegenerative disease caused when a small group of brain cells die that control body movement. Symptoms generally include tremor in arms and legs, stiff and rigid muscles, slowness of movements (especially walking), and impaired balance. It does not discriminate by sex, race, or ethnic background and affects more than 1.5 million people in the United States. Although Parkinson's disease can begin at any age, most people experience the first signs when they are 40 or older.

The disease is not contagious; some people may have a genetic predisposition to it. Parkinson's is chronic and its symptoms usually worsen over time.

In this era of sophisticated medical treatment, people rarely die from Parkinson's disease which, in the past, frequently caused such severe immobility that pneumonia and other problems were common. Now, many kinds of treatments help people maintain mobility and function.

SYMPTOMS

WHAT ARE THE SYMPTOMS?

The four major symptoms of Parkinson's disease are:

- Rigidity – stiffness when the arm, leg, or neck are moved
- Resting tremor – tremor most prominent at rest, when sitting quietly
- Bradykinesia – slowness in initiating movement which may contribute to decreased facial expression, change in speech pattern, shuffling gait, smaller-lettered handwriting, trouble with fine finger movements
- Loss of postural reflexes – poor balance and coordination

Secondary symptoms may include depression, emotional changes, memory and sleep problems, changes in speech patterns, urinary or bowel difficulties, low blood pressure upon standing or problems in chewing or swallowing.

Not everyone with Parkinson's experiences the same symptoms. Moreover, the symptoms can appear slowly and in no particular order. They may affect one side of the body more than the other. It may be many years before symptoms progress to the point where they interfere with normal activities.

About 60% of people with Parkinson's disease experience resting tremor. Symptoms often begin with occasional trembling of one hand that gradually becomes constant. The tremor can progress to the other hand, to the legs, and, occasionally, to the face. Stiffness and decreased manual dexterity can also occur. When people with Parkinson's walk, the arms might not swing as far as usual, and they may drag their legs or shuffle their feet. Handwriting and speech also may become difficult. For instance, speech may become softer or monotonic, making it difficult to understand.

Although tremors would seem to be the biggest problem for people with Parkinson's, the most frustrating symptoms often are those associated with slowed movements. As a result, people with the disease often have trouble dressing, handling eating utensils, and with personal hygiene. They also may experience difficulty rising from chairs, turning over in bed, or getting in or out of cars. Posture may become flexed with the elbows bent, while the feet feel like they are "sticking" to the ground when trying to walk. These elements contribute to unstable and uncoordinated movements.

As mentioned previously, the progression of Parkinson's disease varies among patients. For some, the disease will progress slowly over a 20- to 30-year period, but progressing much faster for others. Without treatment, pronounced disability occurs in about nine years. However, current symptomatic medications may mask progression and patients continue to do well longer.

DIAGNOSIS

HOW IS PARKINSON'S DISEASE DIAGNOSED?

There are no diagnostic tests for Parkinson's disease. Instead, doctors rely on the patient's history and on careful examination. Accurate diagnosis by a doctor experienced in treating people with Parkinson's disease, such as a neurologist, is essential. Such physicians are called movement-disorder specialists.

CAUSES

WHAT CAUSES PARKINSON'S DISEASE?

Although no distinct cause has been determined, Parkinson's disease may be due to a gradual loss of cells in an area deep within the brain called the substantia nigra, which normally produces a chemical called dopamine. Once produced, dopamine travels to other portions of the brain. One portion, called the striatum, is the coordination center for various brain circuits. When there is insufficient dopamine in the striatum, the chemical imbalance leads to the symptoms of Parkinson's. Later in the disease, cells in other portions of the brain and nervous system also degenerate.

No one knows why these dopamine-producing cells die. Scientists are exploring several theories including chemical reactions within the body, exposure to toxic substances, certain genetic factors, and accelerated aging. Any one or a combination of these theories may prove to be the cause of Parkinson's disease.

TREATMENT

WHAT ARE THE TREATMENTS?

Symptomatic treatment for Parkinson's disease is usually successful, especially in the early years, although it does not stop its progress or cure the disease. Experts believe that a comprehensive approach to treatment is the most effective. This approach includes early diagnosis, exercise, good nutrition, and medications that reduce the symptoms.

Many people find that an important part of their care is the help, comfort, and information they get from participating in Parkinson's support groups. These groups discuss such problems as daily living and are among the first to learn about research results and new treatments.

Medications: Medication regimens can provide dramatic relief from the symptoms of Parkinson's. A neurologist will prescribe therapies tailored to each person, but it often takes time and patience to identify the medicine and dosage that works best. It is important to remember that medicine side effects can occur. They may include nausea, vomiting, low blood pressure, involuntary movements, depression, and restlessness. Adjusting dosages of the available medications usually controls these side effects.

The first important breakthrough in drug therapy came in the 1960s when the drug *levodopa* was introduced. Levodopa helps replenish the brain's low supply of dopamine, and helps mask the debilitating symptoms for many with Parkinson's disease. Blocking neurotransmitters which oppose dopamine's action can be helpful. Drugs which inhibit the normal enzyme that shuts off dopamine's action can also provide benefit.

New drugs that mimic the action of dopamine, called dopamine agonists, also are available. They may be prescribed alone in the early disease phase or in combination with levodopa for later stages. These drugs significantly delay the need for levodopa and have fewer side affects. Continuous research will undoubtedly make other drugs available in the future. Those who are interested in participating in trials of new drugs should ask their neurologist for information.

Diet and exercise: People with Parkinson's disease find that eating a well-balanced diet is important in maintaining their general health and strength. In some cases, doctors may recommend adjusting the consumption of protein for those taking levodopa, because protein may interfere with the absorption of the drug.

People with Parkinson's find that exercise, especially swimming and walking, helps maintain muscle tone and strength and improves mobility. Some doctors recommend physical therapy or muscle-strengthening exercises to keep muscles in good tone. Performing full range-of-motion exercises improves balance, walking, and strength.

Surgery: *Pallidotomy* and *thalamotomy* can reduce specific symptoms for some patients. The result is a permanent lesion in the brain. Other surgical options include *deep brain stimulation (DBS)*, which is used in various brain areas according to the patient's individual need. DBS devices are similar to cardiac pacemakers and do not make permanent lesions. Research is continuing in an effort to determine the long-term value of these surgeries.

PROGRESS THROUGH RESEARCH

Research in Parkinson's disease, especially using animal models of the disease, provides tremendous hope for patients. Research focuses on prediction, prevention, and treatment. Some investigators are examining how the brain and motor system regulate movement. Others are searching for environmental factors or toxins that might cause or contribute to the onset of the disorder. Others are interested in why some people seem to be genetically more susceptible to getting the disease. With each finding, scientists/researchers are constantly developing new drugs and surgical procedures that can delay or reverse the disease.

RESEARCH

Please contact the AAN Education and Research Foundation at (612) 623-2412 to contribute to research on Parkinson's disease and other neurologic disorders. Only through continued research can a cure and new treatments be found for Parkinson's disease.

FOR MORE INFORMATION:

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2221 University Ave. SE
Suite 335
Minneapolis, MN 55414
(612) 623-8115
Fax: (612) 623-2491
E-mail: aan@aan.com

American Parkinson Disease Association, Inc.
1250 Hylan Blvd. Suite 4B
Staten Island, NY 10305
(800) 223-2732
Fax: (718) 981-4399
Email: apda@admin.con2.com

National Parkinson Foundation, Inc.
1501 NW 9th Avenue
Bob Hope Road
Miami, Fl 33136-1494
(800) 327-4545
Fax: (305) 548-4403

Parkinson's Action Network
822 College Avenue, Suite C
Santa Rosa, CA 95404
(800) 850-4726
Fax: (707) 544-2363
Email: parkactnet@aol.com

Parkinson's Disease Foundation (PDF)
William Black Medical Building
710 West 168th Street
New York, NY 10032
(212) 923-4700
Fax: (212) 923-4778

The Parkinson's Institute
1170 Morse Avenue
Sunnyvale, CA 94089-1605
(800) 655-2273 In California
(800) 786-2978 In US
Fax: (408) 734-8522

United Parkinson Foundation (UPF)
833 West Washington Boulevard
Chicago, IL 60607
(312) 733-1893
Fax: (312) 733-1896
Email: upf_itf@msn.com

AAN Fact Sheet

Established in 1948, the American Academy of Neurology (AAN) is an international professional association of more than 19,000 neurologists and neuroscience professionals dedicated to providing the best possible care for patients with neurological disorders.

AAN Objectives

The AAN is committed to advancing the art and science of neurology by:

- Ensuring the best possible care for patients with neurological disorders by providing excellence in education through diverse programs in both the clinical aspects of neurology and in basic neurosciences
- Supporting the development of a practice environment that provides ethical, high-quality care for patients with neurological disorders
- Publishing *Neurology*, a prestigious bimonthly scientific journal featuring the results of the finest in neurological scientific research
- Hosting an Annual Meeting where physicians from around the world come to teach, learn, and share the latest scientific research
- Developing practice guidelines and technology assessments, such as the Dementia Guidelines and the Screening and Diagnosis of Autism, that serve as significant influences within the medical community
- Getting actively involved in medical ethics, practice management, physician reimbursement, and legal affairs
- Issuing press releases that summarize research from Neurology and the Annual Meeting, and other AAN activities.
- Publishing *Neurology Today*, a monthly tabloid newspaper covering important clinical, research, policy, practice, and other news relevant to neurologists
- Publishing *Neurology Now*, a quarterly magazine for neurology patients, their families, and caregivers

What is a neurologist?

A neurologist is a medical doctor with specialized training in diagnosing, treating, and managing disorders of the brain and nervous system.

Public Education Campaign: *The Brain Matters*

The AAN, the AAN Foundation (AAN Foundation), and its Corporate Roundtable partners are sponsoring a multi-year public education campaign called *The Brain Matters*.

The Brain Matters raises public awareness about the value of neurology and educates key audiences about the following:

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- The brain and its functions
- Scientific and medical advances in neurology
- How to recognize diseases and disorders affecting the brain
- Steps one can take to keep the brain healthy, including fundamentals like supporting basic research

For More Information

For more information about the AAN and the latest scientific research, please contact Robin Stinnett at rstinnett@aan.com or (651) 695-2763.

Public Education

What are the symptoms of Alzheimer's disease? Where can I find more information about epilepsy? How can I get an accurate diagnosis for MS? How can I learn more about how families can help somebody who has had a stroke?

There are a lot of questions surrounding brain diseases. The American Academy of Neurology (AAN) and the American Academy of Neurology Foundation (AAN Foundation) can help you find the answers:

- *Neurology Now*, the new patient- and family-focused magazine, with feature stories and regular sections providing helpful information and support to individuals living with neurological diseases. Available through your neurologists' office or subscribe at www.neurologynow.com .
- The Brain Matters Website, features the experiences of people living with brain diseases, as well as provides links to top resources.
- Think Neurology Now is presented by the American Academy of Neurology and its Foundation to increase awareness about disorders of the brain and nervous system and the critical role neurologists play in ensuring the best possible care for patients. Visit www.thinkneurologynow.org for more information.
- The American Academy of Neurology Foundation, helps scientists discover the causes and treatments of brain disorders by raising money to support their research. The AAN Foundation also increases awareness of the importance for hope and research through public education activities.
- The *Neurology* Patient Page provides a critical review of ground-breaking discoveries in neurological research that are written especially for patients and their families. The page includes up-to-date patient information about many neurological diseases, links to additional information, and resources for neurological patients.
- The AAN Patient Education Series is a series of books dedicated to providing valuable information to patients and caregivers. Each volume provides in-depth coverage of a particular condition in a reader friendly format. The latest information and treatment options are provided by the authors, all experts on their topic.

For more information about AAN and AAN Foundation public education programs, contact AAN Member Services at memberservices@aan.com.

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About the AAN

The American Academy of Neurology (AAN), established in 1948, is an international professional association of more than 19,000 neurologists and neuroscience professionals dedicated to providing the best possible care for patients with neurological disorders.

The AAN is strongly committed to its mission and focuses its efforts on ensuring the reality of the principles and standards set forth in the AAN mission statement.

Mission Statement

The American Academy of Neurology is a medical specialty society established to advance the art and science of neurology, and thereby promote the best possible care for patients with neurological disorders by:

- Ensuring appropriate access to neurological care.
- Supporting and advocating for an environment which ensures ethical, high quality neurological care.
- Providing excellence in professional education by offering a variety of programs in both the clinical aspects of neurology and the basic neuroscience to physicians and allied health professionals.
- Supporting clinical and basic research in the neurosciences and related fields.

Online Financial Disclosure Information
AAN Fact Sheet

AAN Executive Staff

Back Row: Linda Morgan, Christine Phelps, Rod Larson, Melanie Hoffert, Mary Post
Front Row: Bruce Polsky, Tim Engel, Murray Sagsveen, Catherine Rydell

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Finance: Oversees cash, investment, and insurance management, audit preparation and tax reporting, budget planning facilitation, financial statements, and accounts receivable/payable and payroll administration.

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Center for Health Policy: Promotes state and federal advocacy initiatives (legislative, regulatory, and coding/ reimbursement) and develops and disseminates clinical guidelines and practice management tools to benefit the practice of neurology and improve the lives of patients.

Rod Larson, Health Policy Director
rlarson@aan.com or (651) 695-2772

Health Policy Specialist: Bonne Lind
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Center for Education and Science: Advances the fields of neurology and neuroscience by developing innovative, quality programs designed to enhance and improve the treatment of patients with neurological disorders.

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AAN Foundation: Works to broaden the base of support for public education and research in neurology.

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lmorgan@aan.com or (651) 695-2759

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AAN Enterprises, Inc.: Facilitates the development of new products and services for members and provides management responsibilities for such AAN press publications as Neurology, Neurology Today, AANnews, and the Patient Education book series, among others.

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Marketing, Communications and Digital: Develops and maintains all communications, strategic marketing programs, and digital product development in order to support the Academy's strategic plan, marketing programs and objectives to serve our members.

Melanie Hoffert, Director
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hdawley@aan.com or (651) 695-2723

Choosing the Medical Specialty of Neurology

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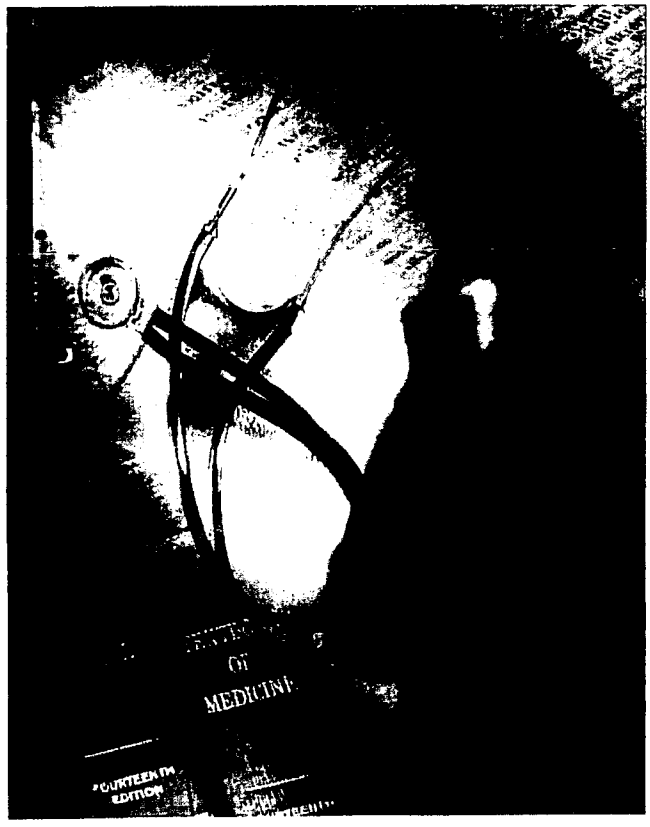

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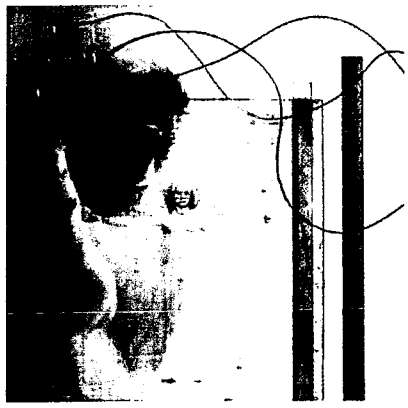
Education & Research Foundation

Neurology as a Specialty

The human brain is the most complex structure in our world. Its intricacies remain unsolved and unending. How we think, reason, move, sense, learn and communicate – all are determined by the brain.

The medical specialty of neurology focuses on the total nervous system, which includes the brain, spine, nerves and muscles. In recent years, research performed by neurologists has greatly advanced understanding of the brain and nervous system. With this new understanding, neurologists are developing new treatments and, ultimately, cures for a host of neurological diseases, which are among the most destructive and costly public health problems in the United States.



For example, today neurologists can successfully treat stroke patients with clot-busting medication proven to reduce deaths and decrease disability. Research developments have also produced new medications that relieve migraines, slow the progression of multiple sclerosis and improve movement for patients with Parkinson's disease. These are just a few of the many advances neurologists use to help improve the lives of millions of men, women and children around the world with neurological disorders.

The future is promising for the medical specialty of neurology. Advanced therapies, new diagnostic techniques and the aging population ensure a strong demand for neurologists today and in the future.

Common Disorders Treated by Neurologists

- Stroke
- Alzheimer's disease
- Headache
- Epilepsy
- Parkinson's disease
- Sleep disorders
- Multiple sclerosis
- Pain
- Tremor
- Brain and spinal cord injuries
- Muscle disorders
- Brain tumors
- Peripheral nerve disorders
- Amyotrophic Lateral Sclerosis

Practice Options – Patient Care, Research & Education

Neurologists working in patient care can act as principal care physicians and consultants to other physicians. When a patient has a neurological disorder requiring frequent care, a neurologist is often the principal care provider. Patients with disorders such as epilepsy, Alzheimer's disease or multiple sclerosis may use a neurologist as their principal care physician.

In a consulting role, a neurologist will diagnose and treat a neurological disorder and then advise the primary care physician managing the patient's overall health. For example, a neurologist would act in a consulting role for conditions such as stroke, concussion or headache.

Neurologists can also choose an academic career in research and education. Neurology research focuses on investigating the intricacies of the healthy and diseased brain and nervous system. Researchers also strive to translate scientific breakthroughs into treatments for patients.

As educators, neurologists are involved in training medical students in the art and science of neurology. Neurologists also educate young colleagues through supervised training programs focused on working with patients or in-depth study of a specific disorder.

Educational and Training Requirements

To become a neurologist in the United States, extensive education and training is required. As undergraduates, many future neurologists study psychology, biology, chemistry or biophysical science, though the field includes students with an entire range of academic majors. After graduating from an undergraduate college or university, a student must graduate from an accredited medical school with either a doctor of medicine or doctor of osteopathy degree.

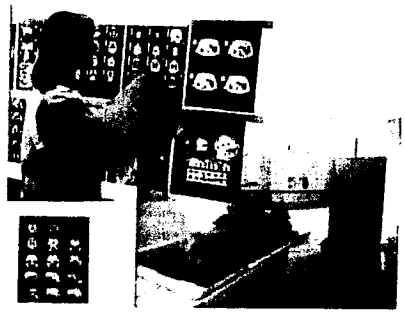
To be eligible for board certification, physicians planning to specialize in neurology must enroll in a residency program accredited by the Accreditation Council for Graduate Medical Education. These residency programs provide supervised neurology training in both hospital and ambulatory care settings. Educational conferences and research training also supplement neurology residency programs.

Physicians specializing in adult neurology will complete one year of internship with a minimum of eight months in internal medicine plus three years of neurology residency. Those specializing in child neurology will spend two years in a general pediatric residency, or a year in both internal medicine and pediatrics, or one year in research and one year in pediatrics. Residents in child neurology then spend at least one year in adult neurology service and two years in a child neurology service.

After completing residency training, neurologists can choose to enroll in a fellowship program. A fellowship offers a neurologist the opportunity to develop expertise in a subspecialty of neurology such as stroke, dementia or movement disorders. Fellowship programs range from one to two years.

Neurology Training Programs

For information about neurology residency programs in the United States, consult the Graduate Medical Education Directory published by the American Medical Association, or contact the San Francisco Matching Programs organization. The San Francisco Matching Programs will help facilitate the application and selection process for medical students seeking neurology residency and fellowship positions. (See resources list.)



Board Certification

Upon completion of residency training, a neurologist may seek certification from the American Board of Psychiatry and Neurology. To be eligible for certification, applicants must:

- possess an unrestricted state licence to practice medicine;
- complete the required years of residency training in the United States;
- pass both a written and oral examination administered by the American Board of Psychiatry and Neurology.

Learn about the American Academy of Neurology and American Academy of Neurology Education & Research Foundation

The goal of both the American Academy of Neurology and the American Academy of Neurology Education & Research Foundation is to ensure the best possible care for patients with neurological disorders.

The American Academy of Neurology is a nonprofit professional medical association of neurologists and allied neuroscience professionals. Medical students attending accredited medical schools in the United States or Canada are eligible for a free American Academy of Neurology membership.

The mission of the American Academy of Neurology Education & Research Foundation is to stimulate research and education in the neurosciences while advancing public understanding of the disorders of the brain and nervous system.

Explore A Career In Neurology

Neurology is a challenging, dynamic specialty that offers physicians a career committed to the exploration and care of the brain and nervous system. For a meaningful medical career with opportunities to improve the lives of patients with neurological disorders and to impact the medical community with research advancements – choose a career in the medical specialty of neurology.

Resources

American Academy of Neurology

- Medical student membership information
- Awards: Neuroscience Prize for high school students, Medical Student Essay Awards, Hoechst Marion Roussel Minority Medical Student Scholarship
- Student Interest Group in Neurology (SIGN)
  SIGN is an ongoing program designed for medical students to explore the field of neurology. Chapters of SIGN are located at universities around the United States and Canada. Call the American Academy of Neurology office or visit its Web site for more information or to locate a chapter near you.

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Accreditation Council for Graduate Medical Education
515 North State Street, Suite 2000
Chicago, IL 60610
Phone: (312) 464-4920
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Web Site: www.acgme.org

American Board of Psychiatry and Neurology
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Suite 335
Deerfield, IL 60015
Phone: (847) 945-7900
Fax: (847) 945-1146
Web Site: www.abpn.com

Educational Commission for Foreign Medical Graduates
3624 Market Street, 4th Floor
Philadelphia, PA 19104
Phone: (215) 386-5900
Fax: (215) 387-9963
Web Site: www.ecfmg.org

San Francisco Matching Programs
P.O. Box 7584
San Francisco, CA 94120
Phone: (415) 447-0350
Fax: (415) 561-8535
Web Site: www.sfmatch.org

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THE AMERICAN ACADEMY OF NEUROLOGY
EDUCATION & RESEARCH FOUNDATION

What is a Neurologist?

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Education & Research Foundation

What is a neurologist?

A neurologist is a medical doctor with specialized training in diagnosing, treating and managing disorders of the brain and nervous system. Pediatric neurologists are doctors with specialized training in children's neurological disorders.

A neurologist's educational background and medical training includes an undergraduate degree, four years of medical school, a one-year internship and three years of specialized training. Many neurologists also have additional training in one area of neurology such as stroke, epilepsy or movement disorders.

What is the role of a neurologist?

Neurologists are principal care providers or consultants to other physicians. When a patient has a neurological disorder that requires frequent care, a neurologist is often the principal care provider. Patients with disorders such as Parkinson's disease, Alzheimer's disease or multiple sclerosis may use a neurologist as their principal care physician.

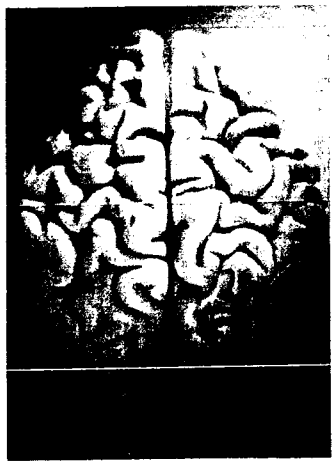
In a consulting role, a neurologist will diagnose and treat a neurological disorder and then advise the primary care physician managing the patient's overall health. For example, a neurologist would act in a consulting role for conditions such as stroke, concussion or headache.

Neurologists can recommend surgical treatment, but do not perform surgery. When treatment includes surgery, neurologists will monitor surgically treated patients and supervise their continuing treatment. Neurosurgeons are medical doctors who specialize in performing surgical treatments of the brain or nervous system.

What does a neurologist treat?

Neurologists treat disorders of the nervous system, brain, spinal cord, nerves, muscles and pain. Common neurological disorders include:

- Stroke
- Alzheimer's disease
- Headache
- Epilepsy
- Parkinson's disease
- Sleep disorders
- Multiple sclerosis
- Pain
- Movement disorders
- Brain and spinal cord injuries
- Brain tumors
- Peripheral nerve disorders
- Amyotrophic lateral sclerosis
- Learning/attention problems
- Cerebral palsy



How are neurological disorders treated?

Many disorders can be treated. Treatment or symptomatic relief is different for each condition. To find treatment options, neurologists will perform and interpret tests of the brain or nervous system. Treatment can help patients with neurological disorders maintain the best possible quality of life.

What is a neurological examination?

During a neurological examination, the neurologist reviews the patient's health history with special attention to the current condition. The patient then takes a neurological exam. Typically, the exam tests vision, strength, coordination, reflexes and sensation. This information helps the neurologist determine if the problem is in the nervous system. Further tests may be needed to confirm a diagnosis or to find a specific treatment.

Why do patients need a neurological examination?

An examination is used when a family doctor seeks a specialized opinion about a patient whose symptoms may involve the brain or nervous system. The examination may also be performed when a patient wants a second opinion from a neurologist. The neurologist's expertise in disorders of the brain and nervous system can give patients effective diagnosis and treatment for neurological disorders.

Who advocates for greater patient access to neurologists?

The American Academy of Neurology supports a patient's choice to receive principal care services from either a neurologist or other physician. The American Academy of Neurology also supports direct access to neurologists and standing referrals for those who require frequent specialty care because of complex neurological conditions.

Advocating for patients, the American Academy of Neurology supports legislation assuring fair treatment of patients with neurological disorders and access to necessary medical care.

How can research help patients?

In recent years, research has advanced understanding of the brain's fundamental mechanisms. With this new understanding, neurologists are finding new treatments and, ultimately, cures for many neurological diseases, which are among the most destructive and costly public health problems in the United States.

For example, research breakthroughs now allow neurologists to successfully treat stroke patients with clot-busting medication proven to reduce deaths and decrease disability. Research developments have also produced new medications that relieve migraines, slow the progression of multiple sclerosis and improve movement in Parkinson's patients. These are just a few of the many advances gained from research that are improving the lives of millions of men and women around the world suffering from neurological disorders.

To keep research advancing toward future cures and treatments, it's important for patients to advocate for additional research funding. Contact your members of Congress and ask them to support neurology research.

What are the American Academy of Neurology and the American Academy of Neurology Education & Research Foundation?

The goal of both the American Academy of Neurology and the American Academy of Neurology Education & Research Foundation is to support the best possible care for patients with neurological disorders.

The American Academy of Neurology is a nonprofit professional medical association of neurologists and allied neuroscience professionals.

The mission of the American Academy of Neurology Education & Research Foundation is to encourage research and education in the neurosciences while advancing public understanding of the disorders of the brain and nervous system.

Common Neurological Tests

Image or sound wave tests

Computerized tomography or computer assisted tomography (CT or CAT scan)
This test uses x-rays and computers to create two-dimensional pictures of selected body parts. Dye may be injected into a patient's vein to obtain a better picture. Other than needle insertion for the dye, this test is painless.

Magnetic resonance imaging (MRI)
An MRI is an advanced way of taking pictures of the inner brain. It is harmless and involves magnetic fields and radio waves. It is performed when a patient is lying in a small chamber for about 30 minutes. Because MRI utilizes a very strong magnet, if you have metal in your body other than dental fillings, notify your physician. Be sure to tell your physician if you suffer from claustrophobia (fear of closed areas). A physician can offer recommendations that can help you relax. This test is painless.

Transcranial Doppler (TCD)
A test that uses sound waves to look at major blood vessels in the brain. A microphone is placed on different parts of the head to view the blood vessels. This test is painless.

Neurosonography
This test uses ultra high frequency sound waves to analyze blood flow and blockage in the blood vessels in or leading to the brain. This test is painless.

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Electrical activity or response tests

Electroencephalogram (EEG)
The EEG records the brain's continuous electrical activity through electrodes attached to the scalp. It is used to help diagnose structural diseases of the brain and episodes such as seizures, fainting or blacking out. This test is painless.

Electromyogram (EMG)
An EMG measures and records electrical activity from the muscles and nerves. This may be helpful in determining the cause of pain, numbness, tingling or weakness in the muscles or nerves. Small needles are inserted into the muscle and mild electrical shocks are given to stimulate the nerve. Discomfort may be associated with this test.

Evoked potentials
This test records the brain's electrical response to visual, auditory and sensory stimuli. This test is useful in evaluating and diagnosing symptoms of dizziness, numbness and tingling, as well as some visual disorders. Discomfort may be associated with this test.

Sleep studies
Involve tests that diagnose specific causes of sleep problems. To perform the tests, it is often necessary for a patient to spend the night in a sleep laboratory. Brain wave activity, heart rate, electrical activity of the heart, breathing and oxygen in the blood are all measured during the sleep test. The test is painless.

Another common test

Cerebral spinal fluid analysis
(Spinal tap or lumbar puncture)
This test is used to check for bleeding, hemorrhage, infection or other disorder of the brain, spinal cord and nerves. In this test the lower back is numbed with local anesthesia, and a thin needle is placed into the space that contains the spinal fluid. The amount of spinal fluid needed to diagnose the specific problem is removed and the needle is withdrawn. Discomfort may be associated with this test.

American Academy of Neurology

The Brain Matters

The American Academy of Neurology Education & Research Foundation

Protecting
and treating
the brain and
nervous system is
the essence of
neurologists' work

For More Information About:

- Patient Support Groups
- Patient Information Brochures
- Contacting Legislators

Contact:

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AMERICAN ACADEMY OF NEUROLOGY

THE AMERICAN ACADEMY OF NEUROLOGY
EDUCATION & RESEARCH FOUNDATION

STROKE

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What are the symptoms?

What are the treatments?

AMERICAN ACADEMY OF NEUROLOGY

WHAT IS STROKE?

A stroke, or brain attack, is caused by the sudden loss of blood flow to the brain or bleeding inside the head. Each can cause brain cells to stop functioning or die. When nerve cells in the brain die, the function of body parts they control is harmed or lost. Depending on the part of the brain affected, people can lose speech, feeling, muscle strength, vision, or memory. Some people recover completely; others are seriously disabled or die.

WHAT ARE THE SYMPTOMS?

Stroke symptoms may not be as dramatic or painful as a heart attack. But the results can be just as life-threatening. Stroke symptoms happen suddenly and include:

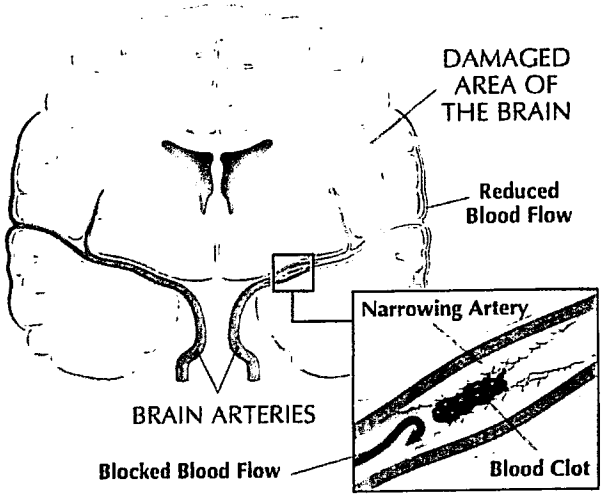
- Sudden numbness or weakness of face, arm, or leg, especially on one side of the body
- Sudden confusion, trouble speaking, or diffuculty understanding
- Sudden trouble seeing in one or both eyes
- Sudden trouble walking, dizziness, loss of balance, or loss of coordination
- Sudden severe headache with no known cause

WHAT CAUSES STROKE?

There are two types of stroke: ischemic and hemorrhagic. Eighty percent of strokes are ischemic. Ischemic strokes can be caused by narrowing of the large arteries to the brain or the small arteries within the brain. Strokes can also be caused by clots that block blood flow to the brain.

Cross Section of the Brain

ISCHEMIC



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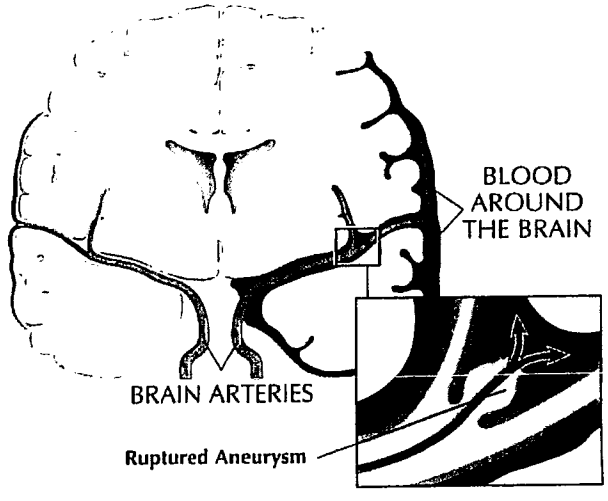

Medical illustrations by Jim Perkins

The lack of normal blood flow to brain cells sets off a chain reaction. When blood cannot get to the brain, cells begin to die within minutes. Quick medical treatment is essential to prevent the damage from spreading to a larger area of the brain, where blood flow might be reduced but not completely cut off. Hemorrhagic strokes involve bleeding around or into the brain, caused by:

- Weak spots in brain arteries, called aneurysms, burst and blood covers the brain
- Small blood vessels within the brain that break

HOW IS STROKE DIAGNOSED?

The neurologist or emergency doctor must examine you to understand your condition and find out what caused the stroke.

Tests include:

- Neurological exam
- Brain imaging tests
- Tests that show blood flow and bleeding sites
- Blood tests for bleeding or clotting disorders
- Electrocardiogram (ECG/EKG) or ultrasound examination (echocardiogram) of the heart
- Tests that measure mental function

WHAT ARE THE TREATMENTS?

Immediate medical care is important. New treatments work only if given within a few hours after a stroke begins. For example, a clot-busting drug must be given within three hours.

For all stroke patients, the goal is to prevent further brain damage. If the stroke is caused by blocked blood flow to the brain, there are several possible treatments. Some options include the use of clot-busting medication, drugs that thin the blood, drugs that lower blood pressure, or surgery that opens the insides of narrowed blood vessels in the neck.

If bleeding causes the stroke, treatment could include:

- Drugs that maintain normal blood clotting
- Drugs that lower blood pressure
- Surgery to remove blood in the brain or decrease pressure on the brain
- Surgery to fix the broken blood vessels
- Blocking off bleeding vessels by inserting a coil

LIVING WITH STROKE

After a stroke, you may have some limitations. These limitations depend on the size and location of the stroke. These limitations can include:

- Loss of vision, often on one side
- Loss of strength or feeling on one side of the body
- Loss of balance
- Problems with thinking and memory
- Difficulty speaking
- Emotional problems, such as depression

There are treatments that can help you live with the effects of stroke. Rehabilitation helps regain functions lost from damage due to stroke. During treatment, most people will get better—although many do not recover completely. The brain can learn new ways of functioning, using undamaged brain cells.

For a story about a person living wi

- Drugs that prevent or reverse brain swelling
- Inserting a tube into a hollow part of the brain to lower pressure

Preventing a Second Stroke

People who have had a stroke are at a much greater risk of having another stroke than those who have never had a stroke. Talk to your neurologist about ways to prevent a second stroke. These may include medications and changes to your lifestyle including:

- Eating a low-salt, low-fat, low-cholesterol diet
- Controlling high blood pressure
- Quitting smoking
- Controlling cholesterol with drugs
- Taking drugs that reduce blood clotting

FOR FAMILY AND FRIENDS

The rehabilitation period is often a challenge for both you and your caregivers. You and your family work with a team of physical, occupational, and speech therapists, along with nurses and doctors. Many people find that support groups are a source of help, comfort, and information.

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h stroke, visit *www.thebrainmatters.org.*

PARTNERING WITH YOUR DOCTOR

A neurologist is a doctor with specialized training in diagnosing, treating, and managing disorders of the brain and nervous system. You need your doctor to know all about your symptoms and medical history. Then he or she can be more effective in diagnosing and treating your disorder. Likewise, you need to get answers to your questions. Diagnosing and managing your neurological disorder is a partnership between you and your neurologist.

Questions to ask your neurologist

- What type of disorder do I have?
- How will this disorder affect my health?
- What is the treatment and what will it do?
- How will this disorder affect my daily life and activities?

Understanding your disorder and treatment may make it easier to live with the effects of stroke.

FOR MORE INFORMATION

American Academy of Neurology Foundation
www.thebrainmatters.org • (800) 879-1960

American Stroke Association
www.strokeassociation.org
(888) 478-7653

National Family Caregivers Association
www.nfcacares.org
(800) 896-3650

National Institute of Neurological Disorders and Stroke
www.ninds.nih.gov
(800) 352-9424

National Stroke Association
www.stroke.org
(800) 787-6537

www.aan.com • (800) 879-1960

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FOR MORE INFORMATION

American Academy of Neurology Foundation
www.thebrainmatters.org • (800) 879-1960

National Institute of Neurological Disorders and Stroke (NINDS)
www.ninds.nih.gov
(800) 352-9424

National Sleep Foundation
www.sleepfoundation.org
(202) 347-3471

AMERICAN ACADEMY OF NEUROLOGY

www.aan.com • (800) 879-1960

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SLEEP DISORDERS

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What are the symptoms?

What are other resources?

What are the treatments?

How is it diagnosed?

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DISORDERS

to diagnose your disorder, your neurologist will evaluate your symptoms. The evaluation starts with a visit to the sleep doctor's clinic. The staff will ask you about your sleep history and perform diagnostic tests. Sometimes a test for daytime sleepiness is done.

You may be asked to keep a sleep/wake diary to record patterns not recognized by you or your doctor.

You may also need an overnight sleep study to measure the quality of your sleep by observing body functions as you sleep. These include heart rate, electrocardiogram, breathing, snoring, brain activity, eye movements, body movements, and oxygen level. Tests may involve applying sensors to your body that are easily removed the next morning. You may also be videotaped so your doctor can see your sleep problem firsthand.

HOW ARE SLEEP DISORDERS TREATED?

Once the tests are done, your sleep doctor will discuss these results with you and make a treatment plan. Most sleep problems are treatable. There are a variety of treatment options, depending on your specific sleep disorder:

- Better sleep habits
- Medication
- Surgical treatment

LIVING WITH SLEEP DISORDERS

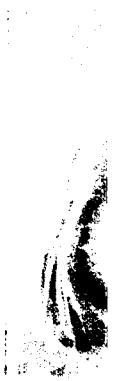
Most sleep disorders are treatable or preventable. There is no need to suffer and lose *even more* sleep over these disorders. Discuss the options with your neurologist.

Overall Good Sleep Practices

Good sleep practices may help you improve your sleep in general. They may also help with some sleep disorders. Try to:

- Sleep only when drowsy
- Sleep only in the bedroom
- Avoid napping
- Limit caffeine, alcohol, and cigarettes
- Avoid a large meal before bed
- Exercise on a regular basis, but avoid strenuous exercise within six hours of bedtime
- Make your bedroom comfortable with low light and noise levels
- Consider relaxation techniques to reduce stress levels
- Keep a sleep/wake diary to record your sleeping patterns

Sleep disorders can affect your relationships with family, especially your spouse. Be sure to talk with your spouse about your disorder and the treatments your doctor has prescribed.



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FOR MORE INFORMATION

American Academy of Neurology Foundation
www.thebrainmatters.org • (800) 879-1960

Citizens United for Research in Epilepsy (CURE)
www.CUREepilepsy.org
(312) 255-1801

Epilepsy Foundation
www.epilepsyfoundation.org
(800) 332-1000

National Family Caregivers Association
www.nfcacares.org
(800) 896-3650

National Institute of Neurological Disorders and Stroke
www.ninds.nih.gov
(800) 352-9424

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www.aan.com • (800) 879-1960

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EPILEPSY (27)

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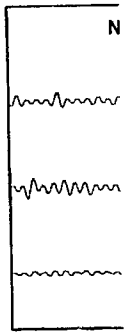

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HOW IS EPILEPSY DIAGNOSED?

Your neurologist will discuss your seizure history with you. He or she will also need your family's medical history to determine whether you have an inherited form of epilepsy. It is likely that your neurologist will also perform several tests, including:

- Recording brain wave patterns with electroencephalography, or EEG
- Computerized imaging of the brain with magnetic resonance imaging, or MRI
- Blood tests

WHAT ARE THE TREATMENTS?

The most common treatment to prevent seizures is the daily use of medications. Between 70 and 80 percent of people using such drugs can control or reduce their seizures. Most people whose seizures are controlled with drugs have few restrictions on their activities.

There are many medications available. Some of them work better for one type of epilepsy than another. It is important to talk to your doctor about the choice of medication, how often it is taken, and any side effects. Side effects, if any, may vary from one drug to another and from one person to another. Your doctor will make sure that the prescribed drug is the best medication for you.

In cases where the disorder has reached an advanced stage, or if drug therapy does not work, surgery may be an option. Talk with your neurologist about the best

LIVING WITH EPILEPSY

Epilepsy is different for each individual. Some people have seizures that are easily controlled; their epilepsy doesn't have much of an effect on their daily lives. Others may find that their seizures will have a bigger impact on their lives, in the way they work, socialize, or do day-to-day activities.

Keeping a seizure diary is important for treating and managing epilepsy. By recording the dates, frequency, and severity of your seizures, you can provide your neurologist with valuable information. He or she can then better understand your condition and develop a treatment plan with a goal of keeping you free of seizures and reducing side effects. Ask your neurologist about keeping a seizure diary.

Women with epilepsy should talk to their doctors about becoming pregnant. Both seizures and the drugs that treat seizures can be harmful to the developing baby. Women need to be under close medical care to make sure the epilepsy is under the best control possible.

FOR FAMILY AND FRIENDS

If you are caring for a family member or friend with epilepsy, take care of yourself as well. Learn more about the condition and effective ways to assist your loved one. Get help from family, friends, and professionals. There are many support groups for caregivers.

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FOR MORE INFORMATION

American Academy of Neurology Foundation
www.thebrainmatters.org • (800) 879-1960

American Council for Headache Education
www.achenet.org
(856) 423-0258

National Headache Foundation
www.headaches.org
(888) NHF-5552

National Institute of Neurological Disorders and Stroke
www.ninds.nih.gov
(800) 352-9424

AMERICAN ACADEMY OF NEUROLOGY
www.aan.com • (800) 879-1960

MIGRAINE HEADACHE

What is the cause?
What are the symptoms?
What are other resources?
What are the treatments?
How is it diagnosed?

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- Uses medications and other treatments to help prevent attacks
- Encourages healthy behavior and lifestyle changes

Keeping a headache diary is a valuable tool for treating migraine. It will help you work with your neurologist to identify triggers and track how drugs are working.

Discuss Acute Treatments

Acute treatments are used to stop an attack when it occurs and treat its symptoms. There are two types of acute treatments: pain relievers and drugs that stop the migraine, called abortive treatments.

Pain-relieving drugs include:

- Nonprescription (over-the-counter) medications, such as aspirin, ibuprofen, or a drug that combines acetaminophen with aspirin and caffeine
- Prescription nonsteroidal anti-inflammatory drugs and analgesics

Abortive treatments include:

- Prescription drugs such as triptans and ergot alkaloids

Consider Preventive Treatments

Daily preventive medications are also available for people with frequent, debilitating headaches. They can also help if your treatment is not working or is causing side effects. They include:

- Tricyclic antidepressants
- Beta-blockers
- Calcium channel blockers
- Some anticonvulsants
- Alternative treatments, such as vitamin B2, magnesium, and feverfew
- Botulinum toxin injections into the scalp muscles
- Nonsteroidal anti-inflammatory drugs

Talk to your doctor about when you can expect the treatment to start to work. Contact your doctor if your treatment is not working as well or if you need to use more acute medication. Overuse of acute drugs can lead to daily rebound headache.

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LIVING WITH MIGRAINE HEADACHE

There are many ways to reduce the impact migraine has on your life. A headache diary will help you and your neurologist develop the best treatment plan for you.

Know and Avoid Your Migraine Triggers

Triggers may include:

- **Diet:** Missed meals, alcohol, foods with monosodium glutamate (MSG), too much caffeine or withdrawal from caffeine, and preserved meats with nitrates and nitrites
- **Sleep:** Too much or too little sleep
- **Stress:** Stress and release from stress
- **Environmental factors:** Weather change, bright or glaring lights, strong odors, and high altitude

Develop a Partnership With Your Neurologist

You and your neurologist will work as a team to treat your migraine. Follow the treatment plan you develop together. See your doctor for regular follow-up visits. Tell your doctor

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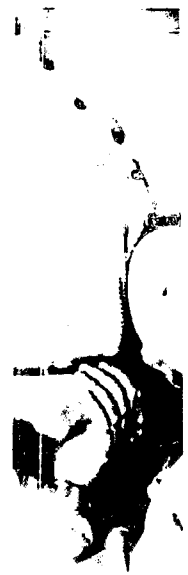

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FOR MORE INFORMATION

American Academy of Neurology Foundation
www.thebrainmatters.org • (800) 879-1960

Multiple Sclerosis Association of America
www.msaa.com
(800) 532-7667

National Family Caregivers Association
www.nfcacares.org
(800) 896-3650

National Institute of Neurological Disorders and Stroke
www.ninds.nih.gov
(800) 352-9424

National Multiple Sclerosis Society
www.nmss.org
(800) 344-4867

AMERICAN ACADEMY OF NEUROLOGY
www.aan.com • (800) 879-1960

MULTIPLE SCLEROSIS

What is the cause?
What are the symptoms?
What are other resources?
What are the treatments?
How is it diagnosed?

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HOW IS MULTIPLE SCLEROSIS DIAGNOSED?

The diagnosis is based on a clinical history and examination. If your doctor thinks your symptoms suggest possible MS, he or she may order a magnetic resonance imaging test (MRI). MRI takes pictures of tissues that cannot be seen in regular X-rays. MRI finds tissue disease or injury, such as the damage seen in people with MS.

WHAT ARE THE TREATMENTS?

Right now, there is no prevention or cure for MS. However, this is a promising time for people with the disorder. Several new drugs have been approved or are close to approval. There are three types of treatments. You should talk to your neurologist about which of these treatments is best for you.

Treatments that help reduce disease activity
These drugs can reduce the number of attacks and long-term damage to the brain.

Treatments for the symptoms of MS
These include drugs to decrease muscle stiffness, reduce tiredness, control bladder symptoms, and ease pain.

Treatments for attacks when they occur
These treatments can shorten an MS attack.

LIVING WITH MULTIPLE SCLEROSIS

Living with MS can create great hardship for people with the disorder and their loved ones. The disorder's unpredictable nature and its onset in the prime of life increase the burden. There are many ways to help reduce this toll.

MS support groups can be a source of help, comfort, and information. You can learn about research results and new treatments. Counseling can be helpful in coping with the emotional aspects of MS.

People with MS can benefit from regular exercise. In addition to improving general health and well-being, exercise can help manage the symptoms of MS. Exercise programs should be tailored to each person. Talk with your neurologist before starting an exercise program.

A well-balanced diet can help maintain good health. People with MS should eat the same low-fat, high-fiber diet that is recommended for the general population.

Pregnancy does not have a long-term effect on women with MS, although there is an increased risk of MS attacks in the months after delivery. You should talk about your pregnancy and any concerns with your neurologist and your other healthcare providers.

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FOR MORE INFORMATION

American Academy of Neurology Foundation
www.thebrainmatters.org • (800) 879-1960

Brain Injury Association
www.biausa.org
(800) 444-6443

National Family Caregivers Association
www.thefamilycaregiver.org
(800) 896-3650

National Institute of Neurological Disorders and Stroke
www.ninds.nih.gov
(800) 352-9424

AMERICAN ACADEMY OF NEUROLOGY
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BRAIN INJURY

What is the cause?
What are the symptoms?
What are other resources?
What are the treatments?
How is it diagnosed?

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the person's level of consciousness and neurological functioning. Brain imaging tests may be used to help in the diagnosis.

WHAT ARE THE TREATMENTS?

The treatment and recovery process is different for each person. No two brain injuries are alike.

Emergency treatment begins at the time of the accident or incident. Medical personnel try to stabilize the person. About half of all severely injured people may need surgery. The surgery may be to remove or repair bleeding in or around the brain or to drain fluid from the brain.

After emergency treatment, people may be in a hospital intensive care unit. Once they are stable, they may move to a regular bed in the hospital.

Some people will need further help after leaving the hospital. Other people whose injuries do not require hospitalization may also need help recovering. Options for rehabilitation can include:

- Outpatient therapy
- Home health services
- Independent living programs

The goal of rehabilitation is to help people regain the highest possible level of independent functioning.

LIVING WITH BRAIN INJURY

The effects of a brain injury can last for months or even years. They can include:

- Problems with cognition, such as memory problems and difficulty concentrating
- Communication problems, such as difficulty expressing yourself and understanding others
- Behavior or mental health problems, such as depression and personality changes

Treatments and help are available for many of these problems. For others, the goal may be to minimize the impact they have on your life.

Many people find that support groups are a source of help, comfort, and information.

Over time, often with the help of counseling, people adjust to their new strengths and weaknesses.

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AAN Summary of Evidence-based Guideline for CLINICIANS

ROGNOSIS OF NEW ONSET

TMENT FOR PARKINSON DISEASE (2002)

AND ALTERNATIVE THERAPIES

This is a summary of two 2006 American Academy of Neurology (AAN) evidence-based guidelines reviewing all of the evidence for diagnosis, prognosis, and neuroprotective and alternative therapies for Parkinson disease (PD) and one 2002 evidence-based guideline assessing the evidence for initiation of treatment for PD.

Please refer to the full guideline for detailed findings and supporting evidence at *www.aan.com.*

RECOMMENDATIONS FOR CLINICAL FEATURES DISTINGUISHING OTHER PARKINSONIAN SYNDROMES FROM PD

Good Level B evidence shows that determining the presence of the following clinical features in early stages of disease should be considered to distinguish other parkinsonian syndromes from PD:

1. Falls at presentation and early in the disease course
2. Poor response to levodopa
3. Symmetry at onset
4. Rapid progression (to Hoehn and Yahr stage 3 in 3 years)
5. Lack of tremor
6. Dysautonomia (urinary urgency/incontinence and fecal incontinence, urinary retention requiring catheterization, persistent erectile failure or symptomatic orthostatic hypotension)

RECOMMENDATIONS FOR DIAGNOSTICS DISTINGUISHING PD FROM OTHER PARKINSONIAN SYNDROMES

Good Level B evidence	The following should be considered for confirmation when the diagnosis of PD is in doubt: • Levodopa[§] and apomorphine[§] challenge • Olfaction testing[§] to differentiate PD from progressive supranuclear palsy (PSP) and corticobasal degeneration (CBD), but not PD from multiple system atrophy (MSA)
Weak Level C evidence	The following may not be useful in differentiating PD from other parkinsonian syndromes: • Electrooculography • Growth Hormone (GH) stimulation with clonidine • Single photon emission computed tomography (SPECT) scanning
Insufficient Level U evidence	There is insufficient evidence to recommend the following as a means of distinguishing PD from other parkinsonian syndromes: • Urodynamics • MRI • Autonomic testing • Brain parenchyma sonography • Urethral or anal EMG • F Fluorodeoxyglucose (FDG) PET

*[§]There is insufficient evidence to determine whether levodopa and apomorphine challenge or olfaction testing have any advantage over the clinical diagnostic criteria of PD **(Level U)**. Additionally, there is insufficient evidence to determine the optimal combination or sequence of these tests **(Level U)**.*

RECOMMENDATIONS FOR CLINICAL FEATURES TO ASSESS PARKINSON DISEASE PROGRESSION

Good Level B evidence	• In patients with newly diagnosed PD, older age at onset and rigidity/hypokinesia as an initial symptom should be used to predict more rapid rate of motor progression **(Level B)**. • Older age at onset and initial hypokinesia/rigidity should be used to predict earlier development of cognitive decline and dementia **(Level B)**.
Weak Level C evidence	• The presence of associated comorbidities (stroke, auditory deficits, and visual impairments), postural instability/gait difficulty (PIGD), and male gender may be used to predict faster rate of motor progression **(Level C)**. • Tremor as a presenting symptom may be used to predict a more benign course and longer therapeutic benefit to levodopa **(Level C)**. • Older age of onset, dementia, and decreased dopamine responsiveness may be used to predict earlier nursing home placement as well as decreased survival **(Level C)**.

Hoffert - 1/18/07

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AAN 00470

NS FOR INITIATION OF TREATMENT FOR PARKINSON DISEASE (2002)

matic treatment of patients with PD with selegiline in order to confer mild, symptomatic benefit stitution of dopaminergic therapy may be considered **(Level A)**.

h who require the initiation of dopaminergic treatment, either levodopa or a dopamine agonist may el. depends on the relative impact of improving motor disability (better with levodopa) compared ig of motor complications (better with dopamine agonists) for each individual patient **(Level A)**.
vith PD in whom levodopa treatment is being instituted, either an immediate-release or ease preparation may be considered **(Level B)**.

ONS FOR NEUROPROTECTIVE THERAPIES FOR PARKINSON DISEASE

Levodopa may be considered for initial treatment of PD (9 months) as it does not accelerate disease progression and is safe. *[There is no long-term evidence to recommend levodopa for neuroprotection. (Level U)]*

Treatment with 2000 units of vitamin E should not be considered for neuroprotection.

- Long-term levodopa use
- Coenzyme Q10
- Riluzole
- Amantadine
- Pramipexole
- Selegiline
- Ropinirole
- Thalamotomy
- Rasagiline

ATIONS FOR ALTERNATIVE THERAPIES FOR PARKINSON DISEASE

	• Exercise • Speech therapy (to improve speech volume)
	• Acupuncture therapy • Biofeedback • M pruriens (Cowhage or velvet bean) • Manual therapy • Alexander technique
ction	• Vitamin E

inal companion tools are available at *www.aan.com* or through AAN Member Services at (800) 879-1960.

en order guidelines at *www.aan.com*.

Treatment for Parkinson Disease (UPDATED)
nd Prognosis for New Onset Parkinson Disease
ctive Strategies and Alternative Therapies for New Onset Parkinson Disease
ind Treatment of Depression, Psychosis and Dementia in Parkinson Disease
d Surgical Treatment of Parkinson Disease with Motor Fluctuations and Dyskinesia

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	Rating of Diagnostic Article	Rating of Prognostic Article
ured (d outcome- respond- anders- tically statistical adjustment	**Class I:** Evidence provided by a prospective study in a broad spectrum of persons with the suspected condition, using a reference (gold) standard for case definition, where test is applied in a blinded evaluation, and enabling the assessment of appropriate tests of diagnostic accuracy. All patients undergoing the diagnostic test have the presence or absence of the disease determined.	**Class I:** Evidence provided by a prospective study of a broad spectrum of persons who may be at risk for developing the outcome (e.g. target disease, work status). The study measures the predictive ability using an independent gold standard for case definition. The predictor is measured in an evaluation that is masked to clinical presentation and, the outcome is measured in an evaluation that is masked to the presence of the predictor. All patients have the predictor and outcome variables measured.
ntative population a RCT in a represen-	**Class II:** Evidence provided by a prospective study of a narrow spectrum of persons with the suspected condition, or a well designed retrospective study of a broad spectrum of persons with an established condition (by "gold standard") compared to a broad spectrum of controls, where test is applied in a blinded evaluation, and enabling the assessment of appropriate tests of diagnostic accuracy.	**Class II:** Evidence provided by a prospective study of a narrow spectrum of persons at risk for having the condition, or by a retrospective study of a broad spectrum of persons with the condition compared to a broad spectrum of controls. The study measures the prognostic accuracy of the risk factor using an acceptable independent gold standard for case definition. The risk factor is measured in an evaluation that is masked to the outcome.
mal healthy controls labeled, where out- objective outcome	**Class III:** Evidence provided by a retrospective study where either persons with the established condition or controls are of a narrow spectrum, and where the reference standard, if not objective, is applied by someone other than the person that performed the test.	**Class III:** Evidence provided by a retrospective study where either the persons with the condition or the controls are of a narrow spectrum. The study measures the predictive ability using an acceptable independent gold standard for case definition. The outcome, if not objective, is determined by someone other than the person who measured the predictor.
se experts or expert	**Class IV:** Any design where test is not applied in an independent evaluation OR evidence provided by expert opinion alone or an descriptive case series (without controls).	**Class IV:** Any design where the predictor is not applied in an independent evaluation OR evidence provided by expert opinion or case series without controls.

mmendation based on the reviewed literature. **Level A**=Established as effective, ineffective, or harmful for the given condition in the specified population. (Level A rating requires at ve, or harmful for the given condition in the specified population. (Level B rating requires at least one Class I study or two consistent Class II studies.) **Level C**=Possibly effective, d population. (Level C rating requires at least one Class II study or two consistent Class II studies.) **Level U**=Data inadequate or conflicting; given current knowledge, treatment is unproven.

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...S, PROGNOSIS, AND TREATMENTS ...LY DIAGNOSED PARKINSON DISEASE

If your doctor thinks you may have Parkinson disease, this information sheet will help you talk with him or her about how Parkinson disease is diagnosed and how it will progress.

Neurologists from the American Academy of Neurology (AAN) are doctors who treat diseases of the brain and nervous system. Experts in Parkinson disease looked at all of the studies on accurate diagnosis, disease progression, and therapies for Parkinson disease. Then they made suggestions that will help doctors and people with Parkinson disease make choices in their care. In some cases, there were not enough published data for or against specific therapies.

What is Parkinson disease?

Parkinson disease is a progressive movement disorder. This means the symptoms will gradually worsen over time. In people with Parkinson disease a vital chemical in the brain, *dopamine*, slowly decreases. Dopamine makes smooth and coordinated muscle movement possible. A loss of dopamine leads to symptoms of Parkinson disease, such as:

- Shaking (tremor)
- Stiffness
- Shuffling walk
- Slowness of movements
- Balance problems
- Small or cramped handwriting
- Loss of facial expression
- Soft, muffled speech

How is Parkinson disease diagnosed?

Parkinson disease is common, but it can be difficult to diagnose. This is especially true in the early stages or in older people. A doctor will make a diagnosis after a complete medical history, review of the symptoms, and a detailed neurological exam.

Your doctor will try to find out if the symptoms are due to Parkinson disease or another condition that has similar symptoms. According to **good** evidence,* history of falls, no tremor, rapid progression of the symptoms, and no affect of drugs on Parkinson-like symptoms may be signs of a similar condition, not Parkinson disease.

Certain drugs are probably useful in confirming if a person has Parkinson disease versus another condition. This is called a "challenge test." If symptoms get better while taking the drugs, the person may have Parkinson disease. The experts found there is **good** evidence* two drugs are probably useful in diagnosing Parkinson disease:

- *Levodopa* is a naturally occurring amino acid that the brain converts to dopamine.
- *Apomorphine* is a man-made form of morphine. It acts like dopamine and stimulates the dopamine system.

Your doctor may also use other tests. There is **good** evidence* that for some patients a smell test can help doctors decide if a person has Parkinson disease versus another condition. At this time there is **not enough** evidence* for or against the use of brain scans, blood tests, or other tests to diagnose Parkinson disease.

What is the prognosis for Parkinson disease?

Parkinson disease usually progresses slowly. Doctors cannot estimate exactly how quickly or slowly it will progress in a patient. This will vary from person to person. However, **good** evidence* shows that Parkinson disease may progress more quickly in people who are older when symptoms begin. Parkinson disease may progress more quickly in people whose symptoms are muscle stiffness and slowness.

There is **weak** evidence* that the disease will progress faster in men and people with a history of stroke, hearing, or vision problems.

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are effective for Parkinson disease?
ro[illegible]ists reviewed all of the studies
u[illegible]sed to treat Parkinson disease.
toms of Parkinson disease doctors

ne agonists: There is **strong**
levodopa or a dopamine agonist
nitial symptoms. *Dopamine*
t stimulate the dopamine system
r complications. Levodopa is a
nino acid that the brain converts
pa provides superior motor benefit
ith a higher risk of dyskinesia.

dence* shows that selegiline
as an initial treatment. There is
* that it is neuroprotective.

Talk to your neurologist
People experiencing the signs of Parkinson disease should seek the care of a neurologist. Your doctor will recommend an individualized treatment plan. This may include lifestyle changes. All treatments have some side effects. The choice of which side effects can be tolerated depends on the individual.

d educational service of the American Academy of Neurology. It is designed to provide members and patients with evi-
commendations to assist with decision-making in patient care. It is based on an assessment of current scientific and clinical
ntended to exclude any reasonable alternative methodologies. The AAN recognizes that specific patient care decisions are
ient and the physician caring for the patient, based on the circumstances involved.

all of the published research studies they describe the strength of the evidence supporting each recommendation:
than one high-quality scientific study
one high-quality scientific study or two or more studies of a lesser quality
udies while favorable are weak in design or strength of the evidence
Either different studies have come to conflicting results or there are no studies of reasonable quality

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MEDICAL AND SURGICAL TREATMENT OF PARKINSON DISEASE WITH MOTOR FLUCTUATIONS AND DYSKINESIA

This is a summary of the American Academy of Neurology (AAN) evidence-based guideline reviewing all of the evidence to determine which medications reduce off time and dyskinesia; their relative efficacy in reducing off time; whether deep brain stimulation (DBS) reduces off time, dyskinesia, medication usage, and improves motor function; and which factors predict improvement after DBS.

Please refer to the full guideline for detailed findings and supporting evidence at *www.aan.com.*

RECOMMENDATIONS FOR MEDICATIONS THAT REDUCE OFF TIME FOR PATIENTS WITH MOTOR FLUCTUATIONS	
Strong Level A evidence	The following medications should be offered to reduce off time in Parkinson disease (PD) patients with motor fluctuations: • Entacapone • Rasagiline
Good Level B evidence	The following medications should be considered to reduce off time in PD patients with motor fluctuations: • Pramipexole • Tolcapone (should be used with caution and requires monitoring for hepatotoxicity) • Ropinirole • Pergolide (should be used with caution and requires monitoring for valvular fibrosis)
Weak Level C evidence	The following medications may be considered to reduce off time in PD patients with motor fluctuations: • Apomorphine *injected subcutaneously* • Cabergoline • Selegiline
Weak Level C evidence	The following medications may be disregarded to reduce off time in PD patients with motor fluctuations: • Sustained release carbidopa/levodopa • Bromocriptine

RECOMMENDATIONS FOR THE RELATIVE EFFICACY OF MEDICATIONS THAT REDUCE OFF TIME FOR PATIENTS WITH MOTOR FLUCTUATIONS	
Weak Level C evidence	Ropinirole may be chosen over bromocriptine to reduce off time in PD patients with motor fluctuations.
Insufficient Level U evidence	There is insufficient evidence to support or refute the use of any other agent over another.

RECOMMENDATIONS FOR MEDICATIONS THAT REDUCE DYSKINESIA	
Weak Level C evidence	Amantadine may be considered for patients with PD with motor fluctuations in reducing dyskinesia.
Insufficient Level U evidence	There is insufficient evidence to support or refute the efficacy of clozapine in reducing dyskinesia. Clozapine's potential toxicity including agranulocytosis, seizures, myocarditis and orthostatic hypotension with or without syncope, and required white blood cell count monitoring must be considered.

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RECOMMENDATIONS FOR DEEP BRAIN STIMULATION (DBS)

Recommendation for efficacy	Factors that predict improvement after DBS
D[illegible] f the STN may be considered as a[illegible].ment option in PD patients to improve motor function and to reduce motor fluctuations, dyskinesia and medication usage (**Level C**). Patients need to be counseled regarding the risks and benefits of this procedure.	Based upon two Class II studies, preoperative response to levodopa is probably predictive of post-surgical improvement. Preoperative response to levodopa should be considered as a factor predictive of outcome after DBS of the STN (**Level B**). Based on one Class II study, younger age and shorter disease duration (less than 16 years) is possibly predictive of greater improvement after DBS of the STN. Age and duration of PD may be considered as factors predictive of outcome after DBS of the STN. Younger patients with shorter disease duration may possibly have improvement greater than that of older patients with longer disease duration (**Level C**).
There is insufficient evidence to make any recommendations about the effectiveness of DBS of the GPi in reducing motor complications or medication usage or in improving motor function in PD patients (**Level U**).	There is insufficient evidence to make any recommendations about factors predictive of improvement after DBS of the GPi in PD patients (**Level U**).
There is insufficient evidence to make any recommendations about the effectiveness of DBS of the VIM nucleus of the thalamus in reducing motor complications or medication usage or in improving motor function in PD patients (**Level U**).	There is insufficient evidence to make any recommendations about the effectiveness of DBS of the VIM nucleus of the thalamus in reducing motor complications or medication usage or in improving motor function in PD patients (**Level U**).

nary and additional companion tools are available at *www.aan.com* or through AAN Member Services at (800) 879-1960.

; AAN movement disorder guidelines at *www.aan.com*.

[illegible]iation of Treatment for Parkinson Disease (UPDATED)
[illegible].gnosis and Prognosis for New Onset Parkinson Disease
Neuroprotective Strategies and Alternative Therapies for New Onset Parkinson Disease
Evaluation and Treatment of Depression, Psychosis and Dementia in Parkinson Disease
Medical and Surgical Treatment of Parkinson Disease with Motor Fluctuations and Dyskinesia

l service of the American Academy of Neurology. It is designed to provide members with evidence-based guideline recommendations n-making in patient care. It is based on an assessment of current scientific and clinical information, and is not intended to exclude any e methodologies. The AAN recognizes that specific patient care decisions are the prerogative of the patient and the physician caring d on the circumstances involved. Physicians are encouraged to carefully review the full AAN guidelines so they understand all sociated with care of these patients.

ry is evidence-based. The AAN uses the following definitions for the level of recommendation and classification of evidence. **Class I:** ed, controlled clinical trial with masked outcome assessment, in a representative population. The following are required: a) primary outcome d, b) exclusion/inclusion criteria are clearly defined, c) adequate accounting for drop-outs and cross-overs with numbers sufficiently low to l for bias, d) relevant baseline characteristics are presented and substantially equivalent among treatment groups or there is appropriate statistirences OR a stastical, population-based sample of patients studied at a uniform point of time (usually early) during the course of the condition. e intervention of interest. The outcome, if not objective, is determined in an evaluation that is masked to the patients' clinical presentations. natched group cohort study in a representative population with masked outcome assessment that meets a-d above OR a RCT in a tion that lacks one criterion a-d OR a statistical, non-referral-clinic-based sample of patients studied at a uniform point in time (usually e of the condition. Most patients undergo the intervention of interest. The outcome, if not objective, is determined in an evaluation that nts' clinical presentations. **Class III:** All other controlled trials including well-defined natural history controls or patients serving as own ative population, where outcome assessment is independently assessed or independently derived by objective outcome measurement measurement: an outcome measure that is unlikely to be affected by an observer's (patient, treating physician, investigator) expecta- d tests, administrative outcome data) OR a sample of patients studied during the course of the condition. Some patients undergo the . The outcome, if not objective, is determined in an evaluation by someone other than the treating physician. **Class IV:** Evidence from case series, case reports, or expert opinion OR Expert opinion, case reports or any study not meeting criteria for class I to III. vel: *"Level"* refers to the strength of the practice recommendation based on the reviewed literature. **Level A**=Established as effective, for the given condition in the specified population. (Level A rating requires at least two consistent Class I studies.) **Level B**=Probably r harmful for the given condition in the specified population. (Level B rating requires at least one Class I study or at least two consistent **C**=Possibly effective, ineffective, or harmful for the given condition in the specified population. (Level C rating requires at least one consistent Class III studies.) **Level U**=Data inadequate or conflicting; given current knowledge, treatment is unproven.

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AAN Guideline Summary for PATIENTS THEIR FAMILIES

ICAL AND SURGICAL TREATMENT MOTOR FLUCTUATIONS AND KINESIA IN PARKINSON DISEASE

Levodopa is converted to dopamine in the brain. It is effective in managing the initial symptoms of Parkinson disease, however over time the effectiveness is reduced and this results in *motor fluctuations*. Motor fluctuations are periods of the day with poor or no response to medication (off time). This alternates with periods of improved function (on time).

Over time people on levodopa or dopamine agonist therapy develop involuntary movements. These are called *dyskinesia*. Dyskinesia in Parkinson disease is caused by medications. This can affect quality of life and may cause disability.

Neurologists from the American Academy of Neurology are doctors who treat diseases of the brain and nervous system. They believe people with Parkinson disease should know which drugs and surgical treatments reduce their off time and dyskinesia.

Experts in Parkinson disease reviewed all of the available studies about medical treatments and deep brain stimulation (DBS) for dyskinesia and motor fluctuations. They made suggestions that will help doctors and people with Parkinson disease make choices in their care. In some cases, there were not enough published data for or against specific therapies.

Medical Treatments to Reduce Off Time

Neurologists looked at all of the studies for medications that reduce off time. While there is stronger evidence* for some drugs, there is not enough evidence* to recommend the value of one drug over another.

There is **strong** evidence* that the following two drugs can decrease off time.

- *Entacapone* is in a group of drugs called *catechol-O-methyltransferase (COMT) inhibitors*. COMT inhibitors increase the length of time that each separate dose of levodopa therapy is effective and reduces per day off time. Entacapone acts in the bowels to increase the amount of levodopa absorbed. Side effects may include dizziness, drowsiness, hallucinations, or change in urine color.
- *Rasagiline* is in a group of drugs called *monoamine oxidase (MAO) inhibitors*. They slow the breakdown of naturally occurring dopamine and dopamine produced from levodopa. Side effects may include headache, depression, or flu-like symptoms.

There is **good** evidence* that these medications may reduce off time:

- *Ropinirole, pramipexole,* and *pergolide* are *dopamine agonists*. They act directly on dopamine receptors. They act like dopamine; they stimulate the dopamine system. Side effects may include confusion, mild nausea, or decreased appetite. Due to potential side effects such as heart and breathing difficulties, pergolide should be used with caution.
- *Tolcapone* is a COMT inhibitor. In rare cases, tolcapone has caused severe liver damage resulting in death. Notify your doctor immediately if you develop nausea, vomiting, abdominal pain, unusual fatigue, loss of appetite, yellow skin or eyes, itching, dark urine, or clay colored stools. These symptoms may be early signs of liver damage. Liver tests should be done often on people taking tolcapone.

There is **weak** evidence* that the following drugs may reduce off time:

- *Apomorphine* and *cabergoline* are dopamine agonists. They act directly on dopamine receptors. Apomorphine is injected like insulin and works rapidly. Apomorphine may cause depression, dizziness, or hallucinations. Cabergoline may cause dizziness, headache, and weakness. As of December 2005, cabergoline was not available in the United States.
- *Selegiline* and *orally-disintegrating selegiline* are MAO-B inhibitors. Side effects may include dizziness or drowsiness, abdominal pain, and anxiety.

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EXHIBIT

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eatments to Reduce Dyskinesia

sor -isease experts also reviewed all of the at drugs that reduce dyskinesia.

line reduces stiffness. There is **weak** evidence* ıtadine may be considered for reducing dyskinesia. cts may include confusion, leg swelling or rash, .ion, dizziness, lightheadedness, drowsiness, or e.

ıe is a drug used for schizophrenia. There is **igh** evidence* for the use of clozapine in reducing ia. Side effects may include decrease in white lls, seizures, or inflammation of the heart muscle. ıe potential harmful effects, frequent blood ng is required.

·eatment

procedure called *deep brain stimulation (DBS)* mprove motor fluctuations and dyskinesia in h Parkinson disease.

cted at three primary targets for Parkinson. All three ·uctures are deep in the brain. In DBS, an electric :trode) is placed in the brain. A wire from the s routed beneath the skin to a pacemaker device near your collarbone. The pacemaker and electrode ı s· ·ific brain structure with pulses of electricity. ıte. e structure in the brain to improve off time ıntary movement. Only special medical centers iis procedure.

s may include thought process and speech disorders, sensory disturbances, abnormal gait, lack of on, headaches, and seizures.

ıould be aware that it is not easy to study surgical in the same way as other medical therapies. It is design a study where neither the physician nor the patient know if the patient went through the real surgical procedure or a comparison (sham) procedure. Therefore, the evidence that DBS successfully treats Parkinson disease is weakened by the research methods involved.

There is **weak** evidence* that DBS using an electrode implanted in the core of the subthalamus may improve function and reduce motor fluctuations, dyskinesia, and drug usage. There is **not enough** information* to make suggestions about DBS in the other two areas of the brain—the thalamus and globus pallidus.

There is some evidence that response to levodopa, age, and duration of Parkinson disease may predict how successful DBS of the subthalamus will be.

Your doctor should discuss potential side effects of this treatment with you. The decision to use this procedure depends on your condition and the risk for complications compared to successful outcomes.

Ten to 20 percent of people with Parkinson disease may be eligible for surgical treatments. Surgery may help long-term by reducing symptoms and improving quality of life. Talk to your neurologist early in your disease to discuss the potential for future surgical treatments.

Talk to your neurologist

Not every treatment works for every patient. A treatment decision will depend on other medical conditions you have and potential side effects. All treatments have some side effects, the choice of which side effects can be tolerated depends on the individual. Your doctor should discuss serious side effects, if any.

evidence-based educational service of the American Academy of Neurology. It is designed to provide members and patients with ɔased guideline recommendations to assist with decision-making in patient care. It is based on an assessment of current scientific and iormation, and is not intended to exclude any reasonable alternative methodologies. The AAN recognizes that specific patient care decisions erogative of the patient and the physician caring for the patient, based on the circumstances involved.

experts review all of the published research studies they describe the strength of the evidence supporting each recommendation:
dence = More than one high-quality scientific study
dence = At least one high-quality scientific study or two or more studies of a lesser quality
dence = The studies while favorable are weak in design or strength of the evidence
gh evidence = Either different studies have come to conflicting results or there are no studies of reasonable quality

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AAN Summary of Evidence-based [illegible] CLINICIANS

[illegible]TION AND TREATMENT OF [illegible]ON, PSYCHOSIS AND [illegible]ENTIA IN PARKINSON DISEASE

This is a summary of the American Academy of Neurology (AAN) evidence-based guideline reviewing all of the evidence to determine the best tools to detect depression, psychosis and dementia and the most effective treatments for depression, psychosis, dementia and dementia with Lewy bodies (DLB) in patients with Parkinson disease (PD).

Please refer to the full guideline for detailed findings and supporting evidence at *www.aan.com*.

RECOMMENDATIONS FOR SCREENING FOR DEPRESSION, PSYCHOSIS AND DEMENTIA

Depression	• The Beck Depression Inventory (BDI- I) and Hamilton Depression Rating Scale (HDRS-17) should be considered for depression screening in PD **(Level B)**. • Montgomery Asberg Depression Rating Scale (MADRS) may be considered for screening for depression associated with PD **(Level C)**.
Psychosis	• No recommendation is made.
Dementia	• The Mini Mental State Examination (MMSE) and the Cambridge Cognitive Examination (CAMCog) should be considered as screening tools for dementia in patients with PD **(Level B)**.

RECOMMENDATIONS FOR TREATING DEPRESSION, PSYCHOSIS AND DEMENTIA

Depression	• Amitriptyline may be considered in the treatment of depression associated with PD **(Level C)**. Although the highest level of evidence is for amitriptyline, it is not necessarily the first choice for treatment of depression associated with PD. • There is insufficient evidence to make recommendations regarding other treatments for depression in PD **(Level U)**. Absence of literature demonstrating clear efficacy of non-tricyclic antidepressants is not the same as absence of efficacy.
Psychosis	• Clozapine should be considered for patients with PD and psychosis **(Level B)**. Clozapine use is associated with agranulocytosis and may be fatal. The absolute neutrophil count must be monitored. • Olanzapine should not be routinely considered for patients with PD and psychosis **(Level B)**. • Quetiapine may be considered for patients with PD and psychosis **(Level C)**.
Dementia	• Donepezil should be considered for the treatment of dementia in PD **(Level B)**. • Rivastigmine should be considered for the treatment of dementia in PD or DLB **(Level B)**.

Copies of this summary and additional companion tools are available at *www.aan.com* or through AAN Member Services at (800) 879-1960.

View the following AAN movement disorder guidelines at *www.aan.com*.

DATE	TITLE
Jan 2002	Initiation of Treatment for Parkinson Disease (UPDATED)
April 2006	Diagnosis and Prognosis for New Onset Parkinson Disease
April 2006	Neuroprotective Strategies and Alternative Therapies for New Onset Parkinson Disease
April 2006	Evaluation and Treatment of Depression, Psychosis and Dementia in Parkinson Disease
April 2006	Medical and Surgical Treatment of Parkinson Disease with Motor Fluctuations and Dyskinesia

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ion-making in patient care. It is based on an assessment of current scientific and clinical information, and is not intended
alternative methodologies. The AAN recognizes that specific patient care decisions are the prerogative of the patient and
e patient, based on the circumstances involved. Physicians are encouraged to carefully review the full AAN guidelines so
nendations associated with care of these patients.

ating of Therapeutic Article	Rating of Screening Article
ical trial with masked outcome assessment, in a representative population - cases with numbers sufficiently low to have minimal potential for bias d and substantially equivalent among treatment groups or there is appropriate	**Class I:** A statistical, population based sample of patients studied at a uniform point in time (usually early) during the course of the condition. All patients undergo the intervention of interest. The outcome, if not objective, is determined in an evaluation that is masked to the patients' clinical presentations
h in a representative population with masked outcome assessment that meets tion that lacks one criteria a-d	**Class II:** A statistical, non-referral clinic based sample of patients studied at a uniform point in time (usually early) during the course of the condition. Most patients undergo the intervention of interest. The outcome, if not objective, is determined in an evaluation that is masked to the patients' clinical presentations
well-defined natural history controls or patients serving as own controls) in independently assessed, or inadequately derived by objective outcome	**Class III:** A sample of patients studied during the course of the condition. Some patients undergo the intervention of interest. The outcome, if not objective, is determined in an evaluation by someone other than the treating physician
ase series, case reports, or expert opinion.	**Class IV:** Expert opinion, case reports or any study not meeting criteria for Class I to III.

rength of the practice recommendation based on the reviewed literature. **Level A**=Established as effective, ineffective, or harmful for the given condition in the specified population. (Level A rating requires at
dably effective, ineffective, or harmful for the given condition in the specified population. (Level B rating requires at least one Class I study or two consistent Class II studies.) **Level C**=Possibly effective, inef-
specified population. (Level C rating requires at least one Class II study or two consistent Class II studies.) **Level U**=Data inadequate or conflicting; given current knowledge, treatment is unproven.

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SCREENING AND TREATMENT FOR DEPRESSION, DEMENTIA, AND PSYCHOSIS WITH PARKINSON DISEASE

Depression, dementia, and psychosis are common in people with Parkinson disease. These conditions can affect how people with Parkinson disease cope and also have an effect on the quality of life for both patients and their caregivers.

Neurologists from the American Academy of Neurology are doctors who treat diseases of the brain and nervous system. They recommend people with Parkinson disease be screened and treated if they show signs of depression or decline in their ability to think, reason, learn, or remember.

Experts in Parkinson disease, dementia, depression and psychosis reviewed all of the available studies about screening and treating depression, psychosis, and dementia in patients with Parkinson disease. They made suggestions that will help doctors, people with Parkinson disease, and their caregivers make choices in their care. In some cases, there were not enough published data for or against specific therapies.

Depression

Depression in people with Parkinson disease is common. Treating depression helps people with Parkinson disease effectively manage both conditions. Often depression is thought of as a normal reaction to living with Parkinson disease, but it is actually a symptom of the disease.

Patients, families and friends, and physicians should be aware of the warning signs. Depressed people will have several of the following symptoms:

- Constant sad, anxious, or "empty" mood
- Feelings of hopelessness, worthlessness, helplessness
- Loss of interest in hobbies or activities
- Decreased energy
- Difficulty concentrating or making decisions
- Insomnia or early-morning awakening
- Appetite and/or weight changes
- Thoughts of death or suicide
- Restlessness, irritability

A doctor will want to know how long the person has felt this way. He or she will ask how severe the symptoms have been.

A trained health care provider may use a depression screening test to make an accurate diagnosis. During a screen for depression, the patient answers a set of questions. The questions evaluate symptoms of depression and anxiety. The experts found **good** evidence* that two screening tests, the Beck Depression Inventory and the Hamilton Depression Rating Scale, are probably useful in detecting depression in people with Parkinson disease. Another screening test, the Montgomery Asberg Depression Rating Scale, had **weaker** evidence* and is possibly useful in detecting depression in people with Parkinson disease.

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A health care provider will prescribe a treatment based on the test results. The experts found **weak** evidence* that *amitriptyline* may be considered to treat depression in people with Parkinson disease. Amitriptyline is in a class of drugs called *tricyclic antidepressants*. These drugs have an effect on chemicals in the brain that affect mood and behavior. The side effects of some of these drugs can be harmful to people with Parkinson disease. Talk to your neurologist, mental health provider, or pharmacist about possible side effects. Some of the side effects include dry mouth, daytime drowsiness, and difficulty urinating—especially in men.

There is **not enough** evidence* regarding the effectiveness of other treatments. Your doctor will use his or her judgement to determine use of these drugs.

Treatment for depression in people with Parkinson disease can be managed by your neurologist or a mental health professional who is in close communication with your neurologist.

Hallucinations and Delusions

Hallucinations consist of seeing or hearing things that are not really there. Examples are seeing animals, insects, children, or a shadow in the room. Over time, the hallucinations may become frightening or threatening. Delusions are fixed thoughts that are not based in the real world. Examples would be believing that nursing staff want to harm you, that your spouse is having an affair, or that people are stealing from you.

d delusions are dangerous because people
a· his can result in injury to themselves
he. .t is also distressing to have delusions
llucinations for both the patient and the

d delusions are the result of the combination
ications acting on previous personality traits
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lia) associated with Parkinson disease.

·e is no accurate screening test for
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ı Parkinson disease may develop dementia.
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od evidence* that two tests are probably
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Cog.

The experts found **good** evidence* that two drugs may be considered to manage dementia in people with Parkinson disease. These drugs are *rivastigmine* and *donepezil*. Rivastigmine may be considered for the treatment of people with Parkinson disease and dementia with Lewy bodies Disease. The benefit with rivastigmine is small and tremor may worsen. Donepezil is possibly effective in improving thought processes in people with Parkinson disease and dementia, but the benefit is also small.

A person with Parkinson disease and dementia requires regular checkups with his or her doctor to ensure the therapies are working.

For Care Partners

Caring for a person with Parkinson disease and dementia is stressful. Care partners should talk to others about any frustrations they are experiencing. Talk to friends or family members, or join a support group for care partners. This can be very helpful. Care partners need to take care of themselves. If the care partner can't take a break, he or she can burn out, develop mental and physical health problems, and become unable to care for the person with Parkinson disease.

Talk to your neurologist

Any change in mood or behavior; problem solving ability; ability to think, reason, or concentrate in a person with Parkinson disease is worth a visit to a neurologist or mental health professional. A doctor will recognize the symptoms of depression, dementia, or other mental health conditions.

e-based educational service of the American Academy of Neurology. It is designed to provide members and patients with evi-
line recommendations to assist with decision-making in patient care. It is based on an assessment of current scientific and clinical
not intended to exclude any reasonable alternative methodologies. The AAN recognizes that specific patient care decisions are
he patient and the physician caring for the patient, based on the circumstances involved.

eview all of the published research studies they describe the strength of the evidence supporting each recommendation:
More than one high-quality scientific study
At least one high-quality scientific study or two or more studies of a lesser quality
The studies while favorable are weak in design or strength of the evidence
ıre = Either different studies have come to conflicting results or there are no studies of reasonable quality

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RECOMMENDATIONS FOR THE ASSESSMENT OF ELECTROENCEPHALOGRAPHY

Weak (Level C) evidence	Generalized or focal convulsive SE	An EEG may be considered in a child presenting with new onset SE as it may determine whether there are focal or generalized abnormalities that may influence diagnostic and treatment decisions **(Level C)**.
ık (Level C) evidence	Pseudostatus epilepticus	An EEG may be considered in a child presenting with SE if the diagnosis of pseudostatus epilepticus is suspected **(Level C)**.
Insufficient (Level U) evidence	Nonconvulsive SE (NCSE)	Although NCSE occurs in children who present with SE, there are insufficient data to support or refute recommendations regarding whether an EEG should be obtained to establish this diagnosis **(Level U)**.

RECOMMENDATIONS FOR THE ASSESSMENT OF NEUROIMAGING

Weak (Level C) evidence	Neuroimaging studies • CT • MRI	Neuroimaging may be considered for the evaluation of the child with SE if there are clinical indications or if the etiology is unknown **(Level C)**. If neuroimaging is done, it should only be done after the child is appropriately stabilized and the seizure activity controlled.
Insufficient (Level U) evidence		There is insufficient evidence to support or refute recommending routine neuroimaging **(Level U)**.

Recommendations for Future Research

1. Prospective studies are needed to define what factors, or combination of factors, may precipitate SE in children.
2. Controlled prospective studies should be conducted to define the role for routine or selective laboratory investigations in the evaluation of children with SE. This should include studies of inborn errors of metabolism, and specific serum toxicology levels, as a cause of SE in children with the diagnostic tests now available.
3. Controlled prospective blinded studies should be conducted to define the setting and timing for EEG done in the evaluation of children with SE, and to determine if postictal and unexpected ictal EEG findings have prognostic and treatment significance.
4. Controlled prospective studies with blinded assessments should examine the yield of neuroimaging, either routine or selective, in children with SE.
5. Prospective studies are needed to determine the frequency of NCSE after the control of convulsive SE in children, its etiology, and prognostic significance.

This guideline summary is evidence-based. The AAN uses the following definitions for the level of recommendation and classification of evidence.

Class of Evidence: *"Class"* refers to the quality of research methods employed in the reviewed literature; **Class I:** A statistical, population-based sample of patients studied at a uniform point in time (usually early) during the course of the condition. All patients undergo the intervention of interest. The outcome, if not objective, is determined in an evaluation that is masked to the patients' clinical presentations; **Class II:** A statistical, non-referral-clinic-based sample of patients studied at a uniform point in time (usually early) during the course of the condition. Most (>80%) patients undergo the intervention of interest. The outcome, if not objective, is determined in an evaluation that is masked to the patients' clinical presentations; **Class III:** A selected, referral-clinic-based sample of patients studied during the course of the condition. Some patients undergo the intervention of interest. The outcome, if not objective, is determined in an evaluation by someone other than the treating physician; **Class IV:** Expert opinion, case reports, or any study not meeting criteria for Class I to III. This is a new Classification scheme developed by the Quality Standards Subcommittee (QSS) for studies related to determining the yield of established diagnostic and screening tests or interventions and is appropriate only when the diagnostic accuracy of the test or intervention is known to be good. Additionally, the abnormality potentially identified by the screening intervention should be treatable or should have important prognostic implications. This Classification is different than others currently recommended by the QSS that have been published in recent parameters that relate to diagnostic, prognostic, or therapeutic studies.

***Recommendation Level:** *"Level"* refers to the strength of the practice recommendation based on the reviewed literature. **Level A**=Established as effective, ineffective, or harmful for the given condition in the specified population. (Level A rating requires at least two consistent Class I studies.) **Level B**=Probably effective, ineffective, or harmful for the given condition in the specified population. (Level B rating requires at least one Class I study or at least two consistent Class II studies.) **Level C**=Possibly effective, ineffective, or harmful for the given condition in the specified population. (Level C rating requires at least one Class II study or two consistent Class III studies.) **Level U**=Data inadequate or conflicting; given current knowledge, treatment is unproven.

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AAN Guideline Summary for PATIENTS AND THEIR FAMILIES

G THE CAUSE OF STATUS IN CHILDREN

This summary will provide you with information about tests that help doctors identify the cause of *status epilepticus* in children.

What is a seizure?

A *seizure* is caused by a sudden, temporary change in the normal electrical activity of the brain. It usually results in body movements or behaviors that are abnormal and beyond a person's control. A seizure also changes how a person feels or senses things. Some people may even lose consciousness during a seizure.

What is status epilepticus (SE)?

SE is a seizure, or series of seizures, that lasts more than 30 minutes. SE is a life-threatening emergency. It needs to be evaluated and treated in a hospital. In the United States, SE affects more then 30,000 children under age 18 each year. It is most common in infants and toddlers. Many children who experience SE have *epilepsy*. Epilepsy is a brain disorder in which seizures recur.

Diagnosing the cause of SE

Neurologists from the American Academy of Neurology and the C ' Neurology Society are doctors who treat diseases of the b... and nervous system. Experts in neurology carefully reviewed all of the available scientific studies about tests for children with SE.

Laboratory tests

Your child's doctor may perform laboratory tests. These include checking anti-epileptic drug (AED) levels and performing *toxicology studies, blood cultures,* and *lumbar puncture.*

AEDs are drugs used to treat epilepsy. There is good evidence* that doctors should check AED levels when a child with epilepsy develops SE, if the child is currently taking AEDs.

A toxicology test looks at blood, urine, or hair for the presence of drugs. There is weak evidence* that doctors should perform a toxicology test in children with SE when the cause of SE is not known.

Unless the doctor suspects an infection, there is not enough evidence* for or against doing the following tests on a routine basis:

- *Blood culture,* a test to determine if bacteria or fungus are present in the blood
- *Lumbar puncture* (spinal tap), a test to evaluate the fluid surrounding the brain and spinal cord

When the doctor suspects an infection, blood cultures and lumbar puncture are part of the evaluation.

Metabolic and genetic testing

Inborn errors of metabolism and genetic disorders may cause epilepsy and brain disorders.

Inborn errors of metabolism are rare genetic disorders. They cause the body to be unable to *metabolize*, or turn nutrients into energy, normally.

There is weak evidence* that doctors should check for inborn errors of metabolism when the cause of SE is not known. This is especially true if the child's medical history suggests a disorder of metabolism.

Genetic tests can be done on children to determine if a condition or disease is causing the SE. There is not enough evidence* that genetic testing (chromosomal or molecular studies) should be done routinely in children with SE.

Electroencephalography (EEG)

An *EEG* is a test that records the electrical activity produced by the brain. An EEG may provide more information about areas of the brain that are abnormal. This information may affect decisions about diagnosis and treatment.

There is weak evidence* that doctors should obtain an EEG for a child with newly developed SE.

Pseudostatus epilepticus is an event that looks like SE. It may also occur in children. There is weak evidence* that doctors should obtain an EEG for a child who presents with SE and if the doctor suspects pseudostatus epilepticus.

Nonconvulsive status epilepticus (NCSE) is another form of SE. NCSE occurs in children who also have SE. There is not enough evidence* for or against obtaining an EEG to help the doctor make a diagnosis of NCSE.

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Brain imaging studies

Doctors use different methods to take pictures of brain structure and function. Some common imaging techniques include *computed tomography* (CT) and *magnetic resonance imaging* (MRI).

There is weak evidence* that doctors should obtain brain imaging studies if there are clinical signs of SE, or if the cause is unknown. Brain imaging studies should be done only after the child is stable and the seizures are controlled.

There is not enough evidence* for or against doing brain imaging studies on a regular basis.

Talk to your neurologist

Family members and caretakers of a child with status epilepticus should talk with a neurologist. Neurologists can provide correct information about diagnosis and assessment. Ask your neurologist for more information and available services.

* After the experts review all of the published research studies they describe the strength of the evidence supporting each recommendation:

Strong evidence = More than one high-quality scientific study

Good evidence = At least one high-quality scientific study or two or more studies of a lesser quality

Weak evidence = The studies, while supportive, are weak in design or strength of the findings

Not enough evidence = Either different studies have come to conflicting results or there are no studies of reasonable quality

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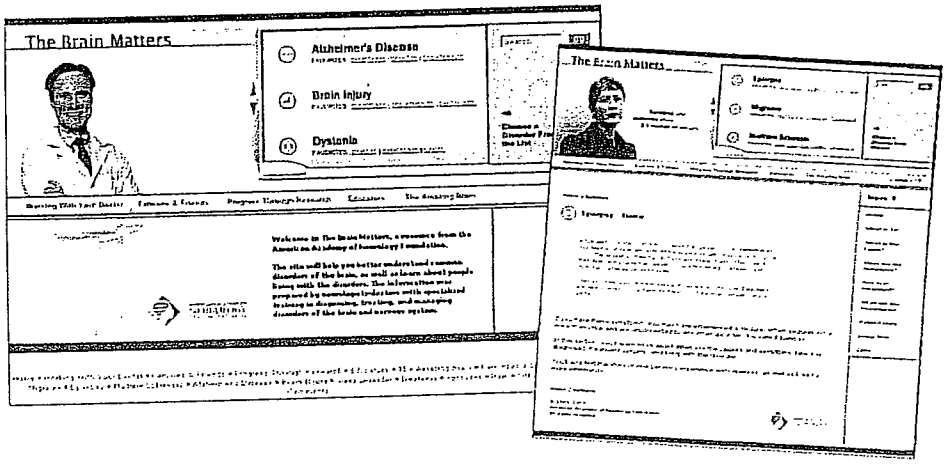
Thebrainmatters.org Answers You Need, From a Source You Trust

At Your Fingertips

The Brain Matters website was developed along with experts in neurology, but you don't need to be one to use it. Log on to the website to find information quickly and easily about the causes, symptoms, and treatments of disorders that affect you and your family.

You can even find a neurologist in your area.



> ***Thebrainmatters.org*** **helps to demystify many neurological disorders, including:**

Alzheimer's disease • Brain injury • Dystonia
Epilepsy • Migraine • Multiple sclerosis Pain
Parkinson's disease • Sleep disorder • Stroke

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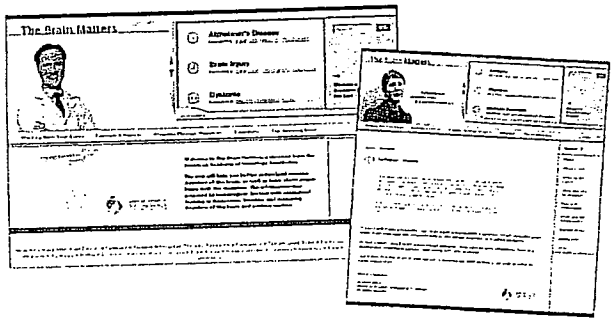
The Brain Matters Website was developed with financial support from Medtronic, the Groff Foundation, and the AAN Foundation Corporate Roundtable.

www.thebrainmatters.org/journal

Answers Your Patients Need, From a Source You Both Can Trust

Recognizing the difficulty in finding a trusted source for information, the American Academy of Neurology, together with its Foundation, developed a public website, The Brain Matters (www.thebrainmatters.org/journal), to meet the information needs of patients and caregivers alike.

At The Brain Matters your patients and their families will find information quickly and easily about the causes, symptoms, and treatment of disorders that aimpact their lives. The Website also provides valuable links to an array of patient resources and advocacy groups.



> *www.thebrainmatters.org/journal* helps to demystify several neurological disorders, including:

Alzheimer's disease • Brain injury • Dystonia
Epilepsy • Migraine • Multiple sclerosis • Pain
Parkinson's disease • Sleep disorder • Stroke

AMERICAN ACADEMY OF NEUROLOGY Foundation

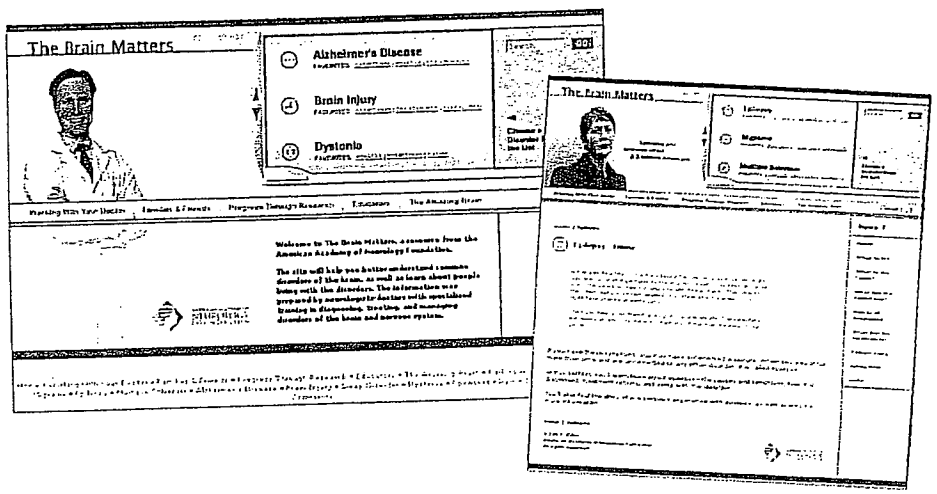
The Brain Matters Website was developed with financial support from Medtronic, the Grofi Foundation, and the AAN Foundation Corporate Roundtable.

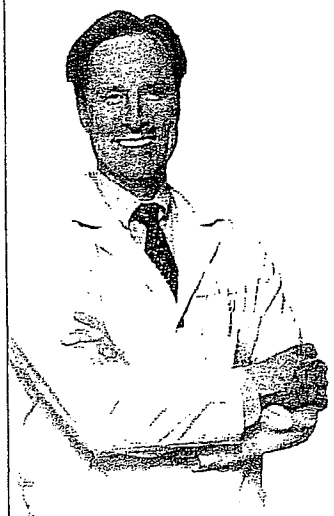
www.thebrainmatters.org/learn
Answers You Need, From a Source You Trust

The American Academy of Neurology (AAN) is the world's leading organization for physicians entrusted with the care of patients with disorders of the brain and central nervous system. Recognizing the difficulty in finding a trusted source for information, the AAN, together with its Foundation, developed a public website, The Brain Matters (www.thebrainmatters.org/learn), to meet the information needs of patients and caregivers alike.

Because if you are concerned about an illness, you need a source you can trust.

Visit this website to find information quickly and easily about the causes, symptoms, and treatment of disorders that affect you and your family. The Brain Matters also provides valuable links to an array of patient resources and advocacy groups.





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November 10, 2000

The Brc

Welcome to The Brain Matters, *helpful, hopeful news about important brain diseases, seven of approximately 200 identifiable brain disorders that affect millions of people in this country, probably even people you know.*

"In the last decade we have seen life-changing treatments for brain disorders..."

America's neurologists, the doctors who specialize in diagnosing and treating brain diseases, invite you to read these pages carefully. Learn the symptoms, the risk factors, the latest in research. And read the moving stories, about people just like us, who are living successfully with a neurological disease.

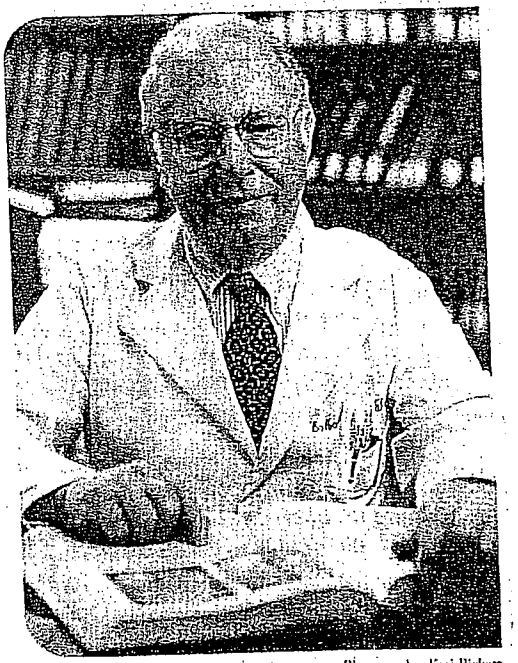
This is an exciting time. In the last decade we have seen life-changing treatments for brain disorders, including the first specific treatments for Alzheimer's, MS, and migraine, plus new advances in treatments for epilepsy, Parkinson's and stroke. Now, we are embarking on a new era in brain research: with the latest technology we can visualize living brains and gain never-before-possible insight into the working of the brain and the degenerative diseases that affect it. In addition, new advances in immunology, cardiovascular, cancer and genetic research are helping us discover treatments and consider cures for disorders that were once considered hopeless.

Contents

in Matters

Brain diseases can be frightening, both for patient and family. Many of the disorders affect thinking, memory and/or behavior, probably among the most difficult of symptoms. Fortunately, in addition to treatments that reduce symptoms, there is an ever-expanding number of resources available to help patients and families at all stages of disability. Page six of this supplement includes a list of many of the organizations dedicated to helping people with brain disorders: please contact any one of them, or a neurologist, to follow-up on what you read here.

Francis I. Kittredge Jr., MD



Photography: Keri Pickett

Sarah Costenero says her friends take her migraine headaches in stride. "That's the best. If you have a friend with headaches, just accept it."

Photography: Keri Pickett

At first Joan Costenero didn't believe her daughter, Sarah. "Here was this little girl, seven years old, in second grade, coming and telling me she had a bad headache. Her head hurt. I'd think 'Oh, maybe it's something else. Maybe it's an excuse so she doesn't have to be outside or do her homework'. There was never a fever or any other symptom. She'd always be better the next day."

But Sarah, and the headaches, persisted. "Finally," Joan recalls, "I decided I'd take her in, have the doctor see her while she was actually complaining of a headache. Let him diagnose whatever it was."

They rushed the few miles to the doctor's office, not far from their home in Carol Stream, Illinois, an hour west of Chicago. Within minutes Joan learned that Sarah had been telling the truth. "The doctor immediately diagnosed migraines. I was surprised," she recalls. "Migraines at age seven?" She's learned that Sarah is among more than 10 million American children, ages 5-17, who deal with chronic headaches.

"I handle it fine, I think"

The pediatrician, who provided routine care for Sarah and her twin sister, Maria (now 12), as well as for younger brother Russel, now 9, tried, unsuccessfully, to treat the headaches for seven months before referring Sarah to a pediatric neurologist. That doctor tried various preventive medications and measures, also without success. Finally, more than two years after the original diagnosis, with the migraines now increasing in severity and occurring up to 15 times a month, mother and daughter sought help from a Chicago neurologist who specializes in treating headache. Now, after two years of treatment, Sarah is finally doing better. Joan Costenero, a speech pathologist, says the search for help was frustrating but common for headache sufferers. "There's a lot of trial and error," she's learned. "This works with one kid, this with another. You have to try a lot of different medications, see what works, deal with the side effects."

Sarah, now 12 and entering the seventh

...are in such pain that they c... go to school."

Sarah, a strong A-/B student who's active in orchestra, chorus and some sports, says she likes school and has learned to deal with the headaches. "I always tell my teachers and they help me get to the nurse's office right away when I get a

headache. I handle it fine, I think." She's learned what kinds of things trigger headaches and plans for that. "If I'm excited about something, I'll expect a headache and know I'll have to get my medicine. If I don't get a headache, it's like a bonus."

Her mother is impressed with Sarah's attitude. "It took a long time for me to say 'I just have to trust her.' If she says she has a headache, we medicate her. She's the one who's suffering. She knows what's going on in her body."

Writing: Margaret Nelson

some are even pain free.

Migraine headache occurs on one side of the head, and is often associated with sensitivity to light and sound, as well as nausea that makes it difficult to take oral treatments. It is similar to other chronic illnesses in that it compromises the sufferer's ability to work and to enjoy life. Researchers believe that serious headaches—migraines, tension, and cluster headaches—are caused by an electrical and chemical instability in the brain. Drugs, along with various behavior modification techniques, can reduce symptoms as well as the frequency and severity of the headaches.

Controlling Migraines

Too many people are self-medicating for their migraines and suffering needlessly. People with migraine will have the best results by taking the following steps:

- Partner with your doctor to develop a treatment plan based on the latest information available.
- Be actively involved in your treatment.
- If headaches persist, ask to be referred to a neurologist.
- Think prevention.

When to See a Doctor About Your Headache

Most headaches come and go rather quickly, with or without the help of over-the-counter agents like aspirin, acetaminophen, or ibuprofen. However, migraine, and other serious headaches generally require medical attention. See a primary care physician or neurologist immediately if:

- *Your headache persists even after treating ... with over the counter ...*
- *You have fever or a stiff neck, as well as headache.*
- *You have other physical changes (in walking, vision, weakness, or other neurological symptoms) along with the headache.*
- *Your headaches get worse—in frequency, duration, or severity.*
- *You suffer headache after an accident or*

Epilepsy—STRIVING FOR Co

What is it?

Epilepsy can vary widely from one person to another. Some people have seizures that are easily controlled, don't affect their day-to-day lives, and go away in time. Others may be devastated by persistent seizures that affect their thinking and/or remembering, cause frequent injuries, and leave them unable to work, drive a car, or have a satisfying social or family life. An outward sign of a malfunction in the electrical system that controls the brain, seizures may appear as convulsions, brief stares, muscle spasms, odd sensations, or episodes of automatic behavior and altered consciousness. When seizures occur more than once, unprovoked and seemingly unconnected to any other ailment, the disease is called epilepsy, or seizure disorder.

Since many things can cause seizures, it's important to see a neurologist for an accurate diagnosis. If a patient has epilepsy, the goal is to find a treatment that will stop the seizures without causing serious side effects. Many people will find success with new drugs approved for epilepsy. In selected cases, surgery, a device called a vagal nerve stimulator, or a special diet, may help provide seizure relief when medications alone are not sufficient.

Unfortunately, not everyone responds well to treatment or achieves that ultimate goal of being seizure free. Research continues into ever more effective treatment options. Meanwhile, chances are that you know people whose seizures are in remission

Ellen Watson has a life many would envy. Born and raised in Cambridge, Massachusetts, she's surrounded by a large and loving extended family, married to the man of her dreams, mother to two lively, vibrant daughters, and has a job she loves, as executive assistant for Cambridge's Board of License Commissioners. "It's a full life, a busy life," Ellen, 39, laughs, obviously delighting in both home and work.

Ellen says everyone she knows is aware of three things for sure: that she has a great family, that she loves her job, and that she has epilepsy. "I've had it since I was 14," she notes. "My parents didn't treat it like a big deal. They were very matter-of-fact about it. And that was good. 'You need to take your medicine so be sure you do that,' they said. It's always been a part of me. I don't know who I'd be without it."

She explained it simply to her daughters: "Daddy has glasses, Mommy has seizures."

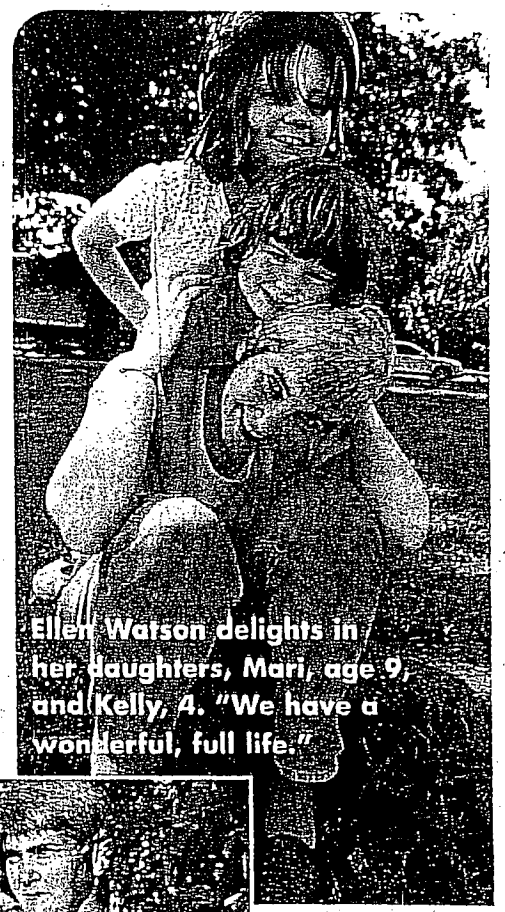
Not that it's easy. She's had seizures at work, on the street, and at home alone with her children. There have been times when she couldn't have managed without her extended family. "My husband would be working and my parents would come over to take care of me and my children," she says. "I am so lucky to have such a loving family." And her husband, Ed, a

ntrol

worse than a seizure. "In college, I'd be walking around like I was drunk or on drugs," she recalls. "Fortunately, I had friends who cared about me. They'd walk me to class, then someone else would come and walk me to the next one. They didn't want me to be alone."

"It's always been a part of me."

Two years ago things looked especially bleak: she even thought she'd have to quit her job. "I was having two seizures a week and it would take me two days to recover from each. I told my boss I just didn't think I could work anymore." But he urged her to take some time off, cut back her hours, and see how things developed.



Ellen Watson delights in her daughters, Mari, age 9, and Kelly, 4. "We have a wonderful, full life."

Photography: Keri Pickett

She's glad she did. After 25 years of persevering and working with a neurologist who specializes in epilepsy, Ellen has finally achieved her goal. She is benefitting from treatment that includes a specific combination of medications plus a vagal nerve stimulator device – treatment that, for now, gives her the seizure control she is seeking. Ellen still lives with epilep-

First Aid for

Multiple Sclerosis —

Eric Simons says he's grateful for a life that includes "the standard house husband stuff" as well as mountain climbing.

Photography: Keri Pickett

"I was feeling miserable and I didn't even know what MS was."

Five years ago, Eric Simons didn't know anything about MS. Suffering from his first acute attack, hospitalized, his right arm paralyzed, his whole right side numb, the mountain climbing executive tried to figure out what was going on. "I was feeling miserable and I didn't even know what MS was. I'd talk to the nurses. I'd talk to the doctors. What was happening?" He laughs, recalling his ignorance. "Did this mean I was one of Jerry's kids? They said no. That's muscular dystrophy. This is multiple sclerosis. MS." He was shocked.

management, planning to advise mining, oil and gas businesses on environmental compliance issues. But less than six months after receiving his degree, 10 days before Thanksgiving, 1995, MS hit. One day he'd been climbing the mountains near his Boulder, Colorado home; the next he was numb.

He went to see his doctor, but was sent

limbing One Mountain at a Time

symptoms and he was concerned. As soon as he saw me, he considered it an emergency. I went to the hospital for an MRI." The brain imaging found a lesion that led doctors to suspect MS; they then did a spinal tap and found a specific protein in the fluid that signaled the disease.

They sent him home for a memorable Thanksgiving. "I couldn't cut my turkey. I was so tired I could hardly sit up," he says, recalling the awkward silences around the table. "It was a devastating thing for everyone—for me, my wife, my kids, my parents."

He "hunkered down" over Christmas, focusing on getting stronger. "I kept thinking I had to be there for my children. My DNA was screaming, 'Be there. You're their father.'" By early February, doctors decided he was ready to try one of the new drugs specially designed to limit MS symptoms. It worked. "The medication isn't a cure, but for now it's giving me and my family a life I can be grateful for." In addition to the medication, Eric believes that his health is enhanced by living a healthy lifestyle. He lives by setting goals, each bigger than the next. First he struggled to walk to the backyard gazebo, then to the corner. Within three years he was climbing mountains, including Mt. Aconcagua in Argentina.

When not climbing, he travels nationwide, giving motivational speeches about MS.

What is it?

Multiple sclerosis, or MS, is a common disease of the nervous system. It strikes people of virtually all ages, but is more likely to strike young people, especially women, and those who grew up in northern latitudes.

Triggered by a variety of causes—possibly including genetic and immune system factors, environmental stimuli, perhaps even viruses—the immune system literally turns against itself, ultimately destroying myelin, the insulating material around the nerve fibers of the brain and spinal cord. Without myelin, signals transmitted through the central nervous system are slowed, garbled or blocked, and symptoms develop, ranging from numbness in the arms or legs, to paralysis or vision problems.

Most people with MS are diagnosed between the ages of 20 and 50, but the course of the disease varies widely from patient to patient and the unpredictable physical and emotional effects can be life long. Fortunately, recent advances in treatment are giving new hope to MS patients and their families, often minimizing symptoms and prolonging the earlier, easier, stages of the disease.

Who's at Risk?

- *People who develop MS probably have a genetic predisposition that is triggered by something in the environment*
- *People who are between the ages of 20 and 50*
- *In North America, people who grew up in*

Alzheimer's Disease —

A Fadin

a De

What is it?

Alzheimer's is a family disease, profoundly affecting not only patients but also those who love them. A degenerative brain disease, Alzheimer's is a common form of dementia that most often begins gradually, causing a person to forget recent events or familiar tasks. Over time, usually over 8-20 years, the disease causes more and more damage, resulting in confusion, personality/behavior changes, and impaired judgment. Think of it as closing off the rooms in your home: gradually, room by room, task by task, fewer things are possible. By the later stages, most people can no longer care for themselves. To make life as good as possible, it's vital that patients be seen by a neurologist as early as symptoms are noted; it's also important for families to seek support in caring for the patient and for themselves.

Scientists still aren't sure exactly what triggers Alzheimer's, but we know that the disease progresses as abnormal structures, called plaques and tangles, form in the brain. When those structures accumulate, the brain's nerve cell connections are reduced, usually

Three years after being diagnosed with Alzheimer's, Rose Washington, 79, still has the sweet, gentle personality that her daughter, Sharon Washington, a school social worker, has always loved. "She's just as sweet as she can be, always has been," Sharon says. But other things have changed—for both mother and daughter, patient and caregiver.

"My mother went from being very independent to now, when it's difficult for her to make decisions," says Sharon, who lives with Rose in a lovely Pittsburgh neighborhood. "We used to be independent and busy. Now life is very limited for both of us." Her mother agrees that life is getting harder. Speaking in a soft voice, sometimes fumbling for the right word, apologizing for being forgetful, she says, "It's annoying and disrupting at times. You can't remember things."

Sharon, 52, the older of two daughters, isn't sure just when the disease began. "I look back and say 'maybe then, maybe that.' It's a slow onset. You realize she's telling the same story, yet AGAIN. Then one day she starts to tell the story but can't

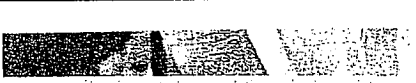
a Mother, voted Daughter

Rose Washington and her daughter, Sharon Washington, say they've settled into a quieter life since Rose was diagnosed with [illegible]

can improve the [illegible]t's quality of life. Watch for [illegible] signs:

- *Memory loss that affects job skills*
- *Difficulty performing familiar tasks*
- *Problems with language*
- *Disorientation to time and place*
- *Poor or decreased judgment*
- *Problems with abstract thinking*
- *Misplacing things*
- *Significant, rapid, changes in mood or behavior*
- *Personality changes*
- *Loss of initiative*

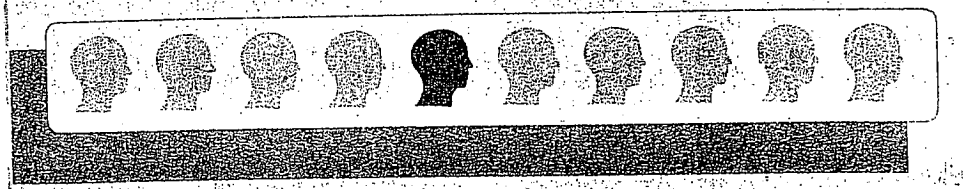
Source: Alzheimer's Association



remember it, can't even remember that she was going to tell you something. By 1997 it was clear that something wasn't there. Something was wrong."

When Rose went for her regular physical that year, Sharon went along and mentioned the memory problems. Rose's primary care doctor referred them to a neurologist at the University of Pittsburgh Medical Center's memory disorder clinic who tested Rose and diagnosed her as being in the early stages of Alzheimer's. There's no specific timeline ahead. "They just talk in general," Sharon says. For now, the medicine is slowing the decline. "I'm glad we caught it early. You hate to hear the diagnosis, but it's good to start treatment. My mother, both of us, can have more good years."

Rose was always a bright light. A lively, personable woman, she'd been a clerk for the U.S. government in Washington, D.C. when Pearl Harbor was bombed. "She went over to Hawaii to help get things organized," her daughter says, telling



1 in 10 people

...as do half of those over age 85. Risk factors are being studied, including: head trauma, high fat diets, and genetic

but it's ... d to start treatment."

stories she'd long heard at her mother's knee. There Rose met Austin "Mack" Washington, a Pittsburgh native who was in Hawaii helping to rebuild the shipyards. They fell in love in 1945, married, and returned home to Pennsylvania. Mack, a carpenter who died in 1982, developed health problems that limited his ability to work. But Rose persevered. She sold insurance when her daughters were young, then worked with troubled children at a local agency for more than 30 years. She was with the City of Pittsburgh, in personnel, when she retired 11 years ago.

At work and at home, Rose was a role model and a wonderful mother, Sharon recalls. "She raised us to be very independent and caring, to have high values, to be trustworthy. She was very warm, very loving, but she made it very clear what was acceptable."

Now the roles are reversing: it's the daughter who tends her mother, who shows her the way. "She's not the woman she was," Sharon says, sadness in her voice. "She can't drive anymore. She has difficulty remembering some things consistently. Sometimes she can't make decisions. Gradually, she's losing more and more." For now, Rose goes to an adult day care setting ("and has the time of her life") and can be left home alone, with attentive neighbors nearby, for a few hours at a time. But she no longer reads like she once did, doesn't do crossword puzzles, cuts short phone conversations. Sometimes she'll mention an old friend, and her daughter will gently prod, "Remember, she died."

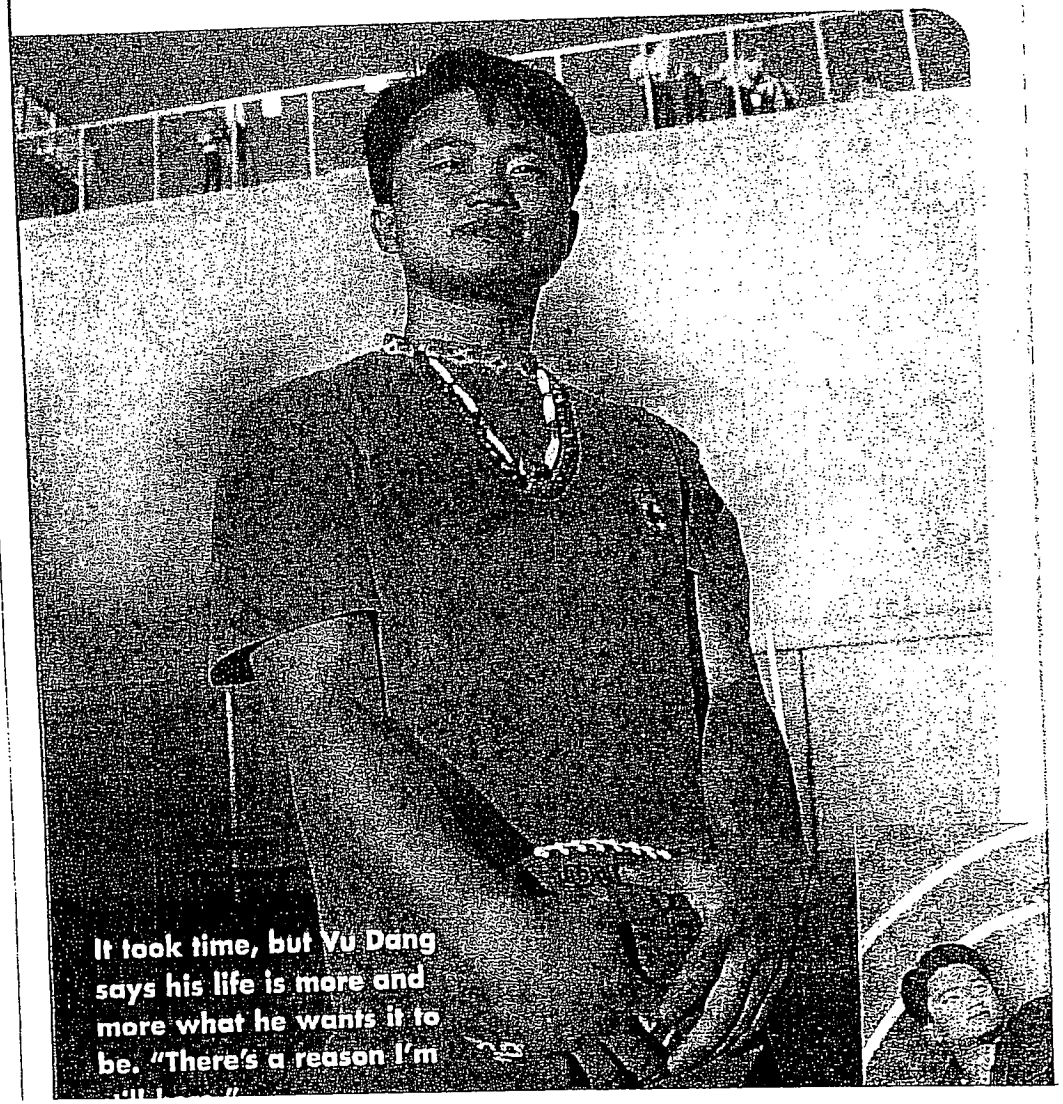
They aim to enjoy every good thing in every day, while planning for what will come. They took care of "the business stuff"—power of attorney, house transfer, funeral arrangements—early on, while Rose could help make those decisions. Now Sharon has begun looking into long-term services, gathering information on assisted living and in-home care. She doesn't know how far their money will go. "We're very financially comfortable, but not when it comes to affording good care, long-term," she says. "There are no projected costs for this: the nursing homes are just now starting to see what care is best. We—our family, and our society—have a lot to learn over the next few years."

She pays close attention to any Alzheimer's news. "I hear of a vaccine and my ears perk up," she says. "I'd love them to develop a vaccine to prolong my mother's life and to protect me." Rose, listening to her daughter, agrees that a cure would be wonderful. But she's also grateful for what she already has. "I have a daughter I can depend on, kind and patient. I feel blessed."

Writing: Margaret Nelson

USA TO

Brain Injury—*Finding* Starti



It took time, but Vu Dang says his life is more and more what he wants it to be. "There's a reason I'm

"It's hard to accept, no doubt [illegible] it," Vu, now 25, says, looking out [illegible]he valley from his hilltop house in Escondido, California, north of San Diego. "You have to adjust to lots of things, give up old dreams, find new ones. It's hard, not only for the one who's been injured, but also for your family. In some ways, it's like starting life over."

Beginning his senior year at Escondido High School, Vu, then 17, was a standout: president of the National Honor Society and other clubs; a top student with a 4.0 GPA; and a starter on the football and baseball teams. He was returning a punt in the first home game of the 1992 season when he ran full-speed into what felt like a brick wall. "I tried to turn it up the field to make something happen and I met three big tackles," he recalls, every pre-accident detail still crystal clear. He fell down in a coma; his breathing stopped. Fortunately, paramedics were on the field within five minutes. "The doctors said 10 minutes later and I would have died," he recalls. "I owe my life to those paramedics." They stabilized him, then rushed to nearby Palomar Medical Center where he underwent three and a half hours of emergency brain surgery. Six days later he came out of the coma. "I didn't remember what had happened. I just knew it was bad."

His left side partially paralyzed, his mind "fuzzy, very fuzzy," he was transferred to Scripps Rehabilitation Center. It was there, working with a multidisciplinary rehab team for a month, that he realized his mind was not functioning as it had [illegible] remember what I read."

"I was stubborn. I just wanted to get out of there."

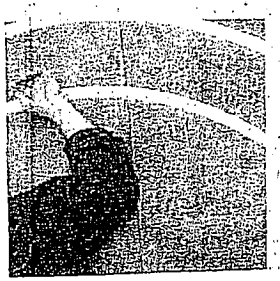
He was angry and frustrated. "I felt like an invalid, incapable. It was hard for me to accept what had happened to me." Looking back, he knows that he left treatment too soon. "I didn't allow myself to fully heal. I was stubborn. I just wanted to get out of there. If I left rehab, I thought I'd be better. If doing it again, I'd allow myself more rehabilitation time." His neurologist tells him that he's not alone: many patients rush rehab, not always aware of how much they have been hurt or that the brain takes far longer to heal and recover than the fading bruises would indicate. After a period of time, they realize they cheated themselves.

Vu had dreamed of going to the Air Force Academy and becoming a pilot, but the brain injury disqualified him. "They're not going to take the risk, having someone with a serious brain injury flying a plane." He then thought of medical school: "Maybe because of the brain injury I thought of becoming a psychiatrist, studying the mind." He started college but soon dropped out. "It takes me a lot longer to read and retain and understand stuff than before I was injured. I couldn't handle the school work."

Today, 6000 people will sustain

New Dreams, ting Over at 17

In the last few years, life has gotten closer to the way he wants it. A tech grip at the nearby Lawrence Welk Theater, he handles behind-the-scenes chores for musicals like *Camelot* and *Funny Girl*. While working at the theater full-time, he served a year with AmeriCorps, tutoring area children. And he recently received his massage therapy license. All the elements are working together, he says, making his life more and more what he'd dreamed. The theater provides stimulating colleagues: "Theater people seem to have a deeper understanding of life than most people. I respect and admire that," he notes. The tutoring was a way to contribute to the community: "I wanted to give a little something back, when I was hurt, I had so much support from everybody." And the massage therapy is the first step en-route to a holistic practitioners' license, a chance to serve people's medical and emotional needs.



Eight years after his accident, Vu says he's finally starting to feel whole, like he's getting back to who he was and

What is it?

Brain injury, also known as concussion in its milder form, can result from something as slight as a mild "ding," or something as major as a consciousness-losing severe injury. However it occurs, concussion and brain injury continue to be a major cause of death and disability for both children and adults. Shocking as it sounds, more American children die of brain injuries than of any other cause. The injuries may result from many things, including domestic violence and child abuse, car accidents, falls, and sporting mishaps. In both children and adults, the longer-term effects of brain injury can range from mildly irritating side effects to a devastating change in personality and ability to function. Like Alzheimer's, severe brain injuries are a family disease, affecting not only patients but those who love them.

Fortunately, both the public and legislators have begun to realize that brain injury is among our most preventable brain disorders. Car safety belts and child car seats; sports safety equipment, and vigilance about not mixing drinking and driving, all help. There's been a particularly significant effort to

my [redacted] He tells h[redacted] what he'd tell others affected by a brain injury: "Always keep in mind that there's a reason why you're still here. The best thing to do is to move forward. Be patient, learn to accept what's happening, and just keep on truckin'."

Writing: Margaret Nelson

sense of self and to make decisions based upon that new reality. The family must do the same, developing a new sense of who the person is and what can be expected.

What are the Signs of Concussion?

Emergency medical treatment within the first few hours can mean the difference between recovery and permanent disability, or even death. It is helpful to have a neurologist involved early in the diagnosis and treatment, and imperative if symptoms persist for more than a few days or weeks. In addition, those at higher risk of head injury, like sports enthusiasts, should learn the symptoms of concussion and avoid returning to play or to high-risk activity too soon after a first concussion. "Second impact syndrome," a second brain injury that occurs while the patient is healing from a first concussion, can be fatal.

Immediate Signs of Concussion

(seen within seconds/minutes):

- Any loss of consciousness
- Impaired attention: vacant stare, delayed responses, inability to focus
- Slurred or incoherent speech
- Lack of coordination
- Disorientation
- Emotional reactions out of proportion
- Memory problems

Later Signs of Concussion

If the following symptoms occur, hours or even days or weeks later, consult a neurologist:

- Persistent headache
- Dizziness/vertigo
- Poor attention and concentration
- Memory problems
- Nausea or vomiting
- Fatigue easily
- Irritability
- Intolerant of bright lights and/or loud noises
- Anxiety and/or depression
- Disturbed sleep

Parkinson's Disease — F
To F

What is it?

Parkinson's disease is one of the best known and understood movement disorders, affecting approximately 1 million people in this country, mostly men and women over 50. Until a cure is found, that number will likely increase as the baby boom generation ages. Fortunately, treatments can often set back symptoms for at least five years and much promising research is being done.

Parkinson's affects the mid-brain, gradually reducing the vital chemical dopamine, and bringing on the symptoms associated with the disease—a tremor on one or both sides of the body; generalized slowness; stiff limbs; and walking or balance problems. For now the cause is unknown, but genetic and environmental factors, acting in combination, are suspected.

It's important to remember that Parkinson's is not a fatal illness; effective treatment is available. Neurologists are finding the greatest success with careful monitoring and a balance between medicines and surgery. Drugs are usually effective in postponing the most difficult symptoms, enabling patients to function at a good level for many years. In addition, surgery can often help restore lost function in patients who cannot be appropriately managed with medication.

Get an Accurate

It was 1972: Air Force Colonel Ronald Duval was 39, a decorated fighter pilot, a veteran of 187 combat missions over Vietnam. He'd never heard of Parkinson's disease, never thought of himself as someone who'd face a physically debilitating illness. Then he got the diagnosis.

He was serving with NATO in Turkey when he realized something was wrong. "I'll never forget the first sign," he recalls, thinking back 28 years. "I was walking along the street in Izmir and my right arm stopped swinging. Then it wasn't long and I had trouble writing." He was sent to the military hospital in Wiesbaden, Germany. "When the military doc, the neurologist, said it was Parkinson's, I didn't know what to do. I'd never heard of it. I went to the library, looked it up," Ron says. "It was a tough thing to face, devastating."

Outgoing, funny, the life of every party, he'd loved flying planes, planned to serve for 30 years before retiring. But Parkinson's changed those plans. Though medication helped control his symptoms, he retired early after eight years of ground jobs and dealing with the disease. "It just got too hard to get to work, to do my work," he says. "I was real sorry to leave but there was really no choice."

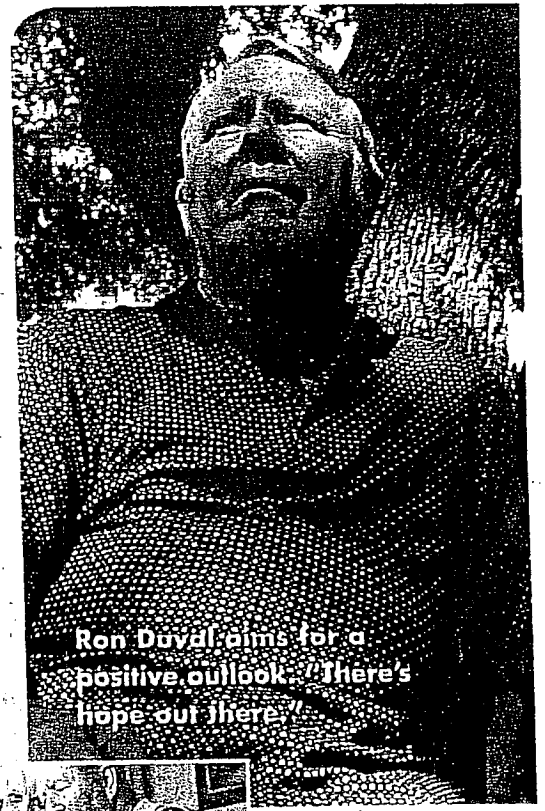
Over the years, he's had to make other lifestyle changes, giving up golf and

From Pilot Patient

Though Parkinson's is a progressive disease, he says that in many ways he's better than he was five years ago. At that point, medication was no longer as effective as it had once been, and he had surgery to alleviate some of his symptoms. "Since the surgery, I've been feeling good, lucky," he says, noting that patients and their families have to have a positive outlook. "There's hope out there. You have to think that way. When I was diagnosed 28 years ago, no one knew about Parkinson's. Now there's much more

"I'll never forget the first sign."

information out there and the treatments are getting better and better. You get a good neurologist, you take the advice, you do the best you can. Hopefully one day there will be a cure."



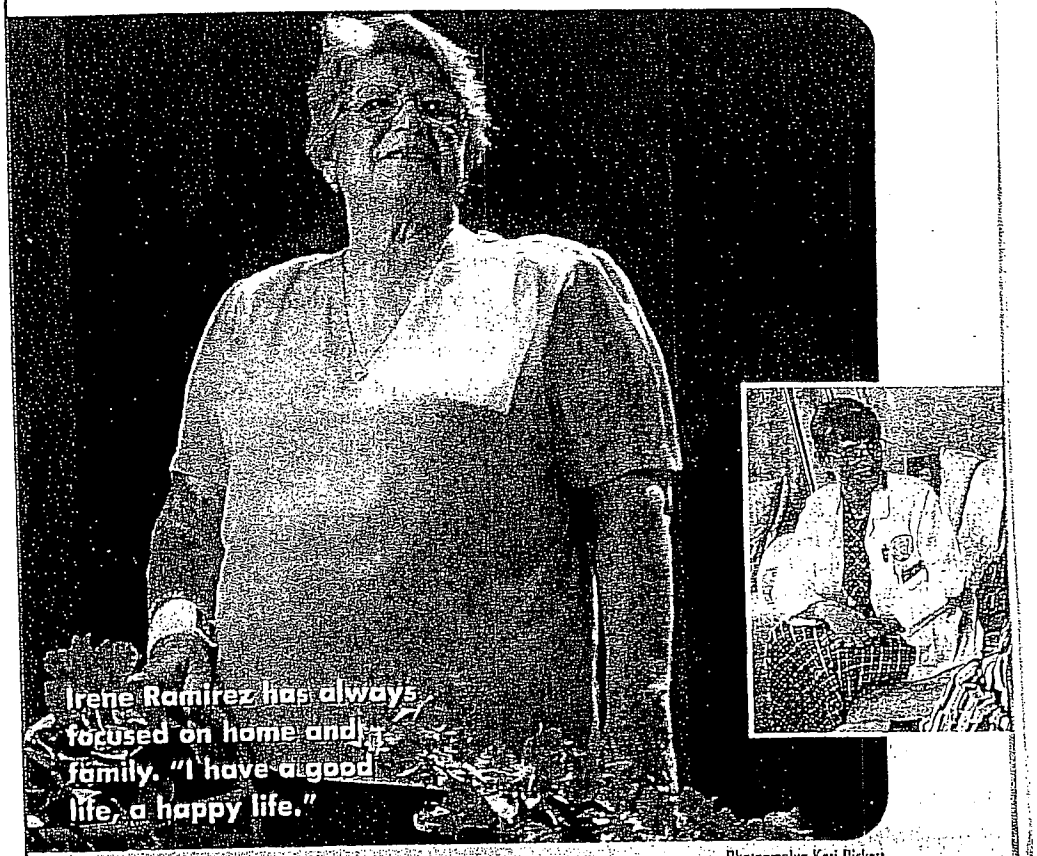
Ron Duval aims for a positive outlook. "There's hope out there."

Photography: Keri Pickett

After Ron retired in 1980, he, his wife, Joan, and their two sons, Ron, Jr., now 41, and Douglas, now 38, settled in San Antonio, Texas. Joan is president of the local Alamo Area Parkinson's support group, 125 patients and caregivers who

At home, both Ron and Joan, high school sweethearts who've been married for 45 years, take special pleasure in Nicholas, the three-year-old grandson they care for two days a week. "He sits in the chair with me and listens to music," Ron says, laughing. "He really likes it. And, of course, I do too."

Stroke—Taking Care



Irene Ramirez has always focused on home and family. "I have a good life, a happy life."

Photography: Keri Pickett

Irene Ramirez, 62, has spent most of her adult life as a homemaker, raising four children ("three boys and finally a girl"), tending her begonias and periwinkles, doing cross-stitch while relaxing after dinner with Jesús, her husband of 40 years. "I liked taking care of my family, cooking, gardening, all those things you do to make a nice home. I enjoyed that totally," she says, admiring her San Antonio garden. "I had a good life before the stroke and I have a good life now."

"If I can help research, that's a good thing."

installation job. He called an ambulance and the emergency room doctors quickly made the diagnosis. "It was a small stroke, they said. I was in the hospital for a week and then I recovered. I could do the things I did before." But something was different. "After it happened once, then I knew about it. I worried about it. Would it

e of Yourself

After recovering completely from her first stroke, she experienced a second, more serious, stroke seven months later, in February of 1999. She had six weeks of therapy, but is not as agile as she once was. "I use a walker now to get around, but it doesn't limit me too much. Mostly I can do what I want to do," she says. "My husband is wonderful: we go places together."

And she's close to her children, especially the two who live in San Antonio. "They take me out. I shop or go to the kids' homes. I get around."

She's careful to take her medicine, as prescribed, both for the stroke and for diabetes, which she knows is a risk factor for stroke. She also sees her neurologist at University Hospital's stroke clinic regularly. Her doctors are trying to help her prevent another stroke, and to learn things that will helpful to other patients, she says. "And I'm helping all I can."

Writing: Margaret Nelson

Know these Warning Signs

Call 911 immediately if you have these symptoms or see them in another.

- *Sudden numbness or weakness of face, arm or leg, especially on one side of the body*
- *Sudden confusion, trouble speaking or understanding speech*

What is it?

Think of stroke as a brain attack every bit as serious to your health as a heart attack. All of a sudden a blood clot or a burst blood vessel interrupts the blood flow to an area of the brain. Within minutes, brain cells in that area begin to die, setting off a series of chemical reactions that endanger even more brain cells. Without prompt medical treatment, that larger area of cells will also die. Depending upon the part of the brain affected, patients can lose speech, movement or memory. Effects can range from relatively minor things like weakness in an arm, to paralysis and lost speech. Some people recover completely; others are seriously disabled or die.

Fortunately, quick medical intervention and treatment can often save lives and prevent many of the more serious, long-lasting, problems. Stroke patients must get immediate medical care. Patients should get to the hospital within 60 minutes of a stroke; neurologists and emergency room physicians can then perform the necessary tests and begin appropriate treatment within three hours of the stroke.

It's vital that patients and families know the three R's of stroke. Reduce your risk: don't smoke, get medical treatment for hypertension and diabetes. Recognize the symptoms. Respond by calling 911 immediately.

Every 53 seconds

Information and Resource Guide

Thanks to the organizations that served as the advisory board for this project.

AAN Education & Research Foundation
800-879-1960
www.aan.com

AARP Andrus Foundation
800-775-6776
www.andrus.org

AGS Foundation for Health in Aging
212-755-6810
www.healthinaging.org

ALS Association
818-880-9007
www.alsa.org

Alzheimer's Association
800-272-3900
www.alz.org

American Academy of Neurology
800-879-1960
www.aan.com

American Academy of Pediatrics
847-434-4000
www.aap.org

American Academy of Physical Medicine & Rehabilitation
800-825-6582
www.aapmr.org

American Association of Electrodiagnostic Medicine
507-288-0100
www.aaem.net

American Association of Neuroscience Nurses
888-557-2266
www.aann.org

American College of Emergency Physicians

American Neurological Association
612-545-6284
www.aneuroa.org

American Osteopathic Association
800-621-1773
www.aoa-net.org

American Parkinson Disease Association
718-981-8001
www.apdaparkinson.com

American Society of Neuroimaging
612-545-6291
www.asnweb.org

American Society of Neurorehabilitation
612-545-6324
www.asnr.com

American Stroke Association, A Division of the American Heart Association
888-478-7653
www.StrokeAssociation.org

Association of University Professors of Neurology
612-545-6724
www.aupn.org

Brain Injury Association
800-444-6443
www.biausa.org

Child Neurology Society
651-486-9447
www.umn.edu

Citizens United for Research in Epilepsy (CURE)
630-734-9957
www.CUREepilepsy.org

Consortium of Multiple Sclerosis Centers
877-700-CMSC
www.mscare.org

Dystonia Medical Research Foundation